2014

The impact of implementing a sudden infant death syndrome education package in Jordan

Shereen Hamadneh
Edith Cowan University

2014

The impact of implementing a sudden infant death syndrome education package in Jordan

Shereen Hamadneh
Edith Cowan University

Edith Cowan University

Copyright Warning

THE IMPACT OF IMPLEMENTING A SUDDEN INFANT DEATH SYNDROME EDUCATION PACKAGE IN JORDAN

Shereen Hamadneh

February, 2014

Submitted in fulfilments of the requirements for the degree of

Doctor of Philosophy

School of Nursing and Midwifery

Faculty of Health, Engineering and Sciences

Edith Cowan University, Western Australia

Supervisors

Professor Anne Wilkinson

Associate Professor Kate Andre

Abstract

Background: Sudden Infant Death Syndrome (SIDS) is a problem worldwide. In North Jordan, SIDS rate was high as 1.32 per 1,000 live births and contributed 6% to the infant mortality rate (Bataineh, Shawagfeh, & Twalbeh, 2008). However, SIDS risk factors are preventable and can be reduced by improving knowledge and changing relevant behaviours of parents and healthcare providers (American Academy of Pediatrics, 2013; American SIDS Institute, 2011; Bataineh, Hussein Shawagfeh, & Twalbeh, 2008; Bredemeyer, 2004; Grazel, Phalen, & Polomano, 2010b; Moon, Oden, & Grady, 2004; NICHD, 2010). Still educating Jordanians about SIDS has not been a national health policy priority. Currently, Jordanians demonstrate infant care practices that increase the risk of SIDS, such as side sleep position and excessive bedding and clothing being the most common practices. Commonly, home environments also are not SIDS safe because of smoking and poor ventilation. Healthcare providers can assume the role of information provider and change agent by working with mothers, families and the community to change practices.

Aims: This study aimed to determine whether a hospital-based SIDS education intervention program, relevant to Jordanian settings, would encourage Jordanian neonatal healthcare providers to revise parent education and training practices regarding SIDS prevention. The long-term goal was to reduce the incidence of SIDS by influencing Jordanian lifestyles and infant care practices.

Methods: This mixed method intervention study included both quantitative and qualitative data collection methods and was conducted at a major education hospital in Jordan, King Abdullah University Hospital (KAUH), over three phases. Phase-1 used two main surveys, an observation-survey explored baseline data on SIDS-safe sleeping positioning practices using an audit of sleeping positions of healthy and medically stable infants in open cots in the neonatal units. The questionnaire-survey explored baseline data on available SIDS teaching resources and staff knowledge and their parental/family instruction regarding SIDS and relevant prevention practices. Phase-2 investigated the development, implementation, and impact of a Jordanian SIDS Infant Education Package (JSEP) among a sample of neonatal healthcare providers at the hospital using the same tools as in the pre intervention phase. This

phase examined the impact the JSEP on neonatal healthcare provider SIDS-knowledge, access to appropriate SIDS resources, SIDS-safe sleeping positioning practices in the neonatal units at KAUH. Phase-3 used focus groups of the JSEP participants to explore participants' experience in undertaking the JSEP.

Results: Phase-1 revealed that high proportion (47%) of a total of 403 infant positioning observations; infants were placed in a high SIDS risk sleeping position. In addition, 33% of a total 231 neonatal healthcare providers who completed the questionnaire-survey had never accessed information or resources for SIDS at baseline. Moreover, 40% of the 231 neonatal healthcare providers who completed the questionnaire-survey did not have any knowledge about national SIDS prevention guidelines released by the American Academy of Paediatrics. In addition, the neonatal healthcare providers had not played an active role in the education of parents and families in Jordan regarding SIDS prevention practices. Only 21% of neonatal healthcare providers sometimes provided SIDS information to parents and families and another 33% rarely advised them. The questionnaire-survey discovered that most advice provided for parents and families regarding infant sleep care practices were inappropriate and, in fact, could heighten the risk of SIDS.

The JSEP in phase-2 resulted in significant improvement in infant positioning practices at KAUH. The proportion of infants who were placed in a high SIDS risk sleeping position decreased to only 21% of the total post-intervention infant positioning observations (N=400), and this change was statistically significant (Chi-square= 40.777; df= 1; $p < 0.05$). Furthermore, the 103 neonatal healthcare providers who participated in the JSEP educational intervention and who completed the questionnaire-survey reported an increase in access to appropriate SIDS information resources and an increase confidence and sufficient knowledge of SIDS risks and prevention practices to advise parents and families. For example, following the JSEP, most advice provided for parents and families regarding infant sleep care practices were appropriate; median scores on the accurate advice scale for infant clothing, positioning, and bed sharing increased, indicating that the advice provided was SIDS-safe and statistically significant difference of less than 0.05.

Phase-3 affirmed that there had been an improvement on neonatal healthcare providers' knowledge, skills and confidence to provide appropriate infant sleep care advice following the JSEP. In particular, neonatal healthcare providers noticed that following their involvement with the JSEP, they felt much more confident to advise parents, families and other child caregivers about the best infant care practice and home environment to keep the infant SIDS safe.

Conclusions: The SIDS education program targeted at neonatal healthcare providers within the Jordanian context was effective in improving staff knowledge, practices and preparedness to instigate parental/family education. Healthcare providers were identified as an effective education and training group for community health promotion. However, challenges were identified in achieving this goal, including overwork, time limitations, staff shortages, and hospitalisation policies, as well as resistance from Jordanian families to adopting SIDS-safe infant sleep care or having a SIDS-safe home environment.

Recommendations: SIDS education programs for health care providers need to be extended, with continued research and evaluation on the effectiveness of specific initiatives in Middle Eastern countries. Further research is needed to explore the incidence of SIDS, SIDS risk factors and associated cultural issues. Furthermore, research need to targeted potentially high risk groups such as refugees, rural and remote residents, and Bedouin families living in isolated regions of Jordan.

Table Of Contents

List of Figures

List of Tables

List of Appendixes

Acknowledgments

I would thank KAUH and ECU for supporting this research. I would acknowledge my wonderful supervisors Professor Anne Wilkinson and Associate Professor Kate Andre for their support, cooperation, and academic guidance. All appreciation and thanks for Professor Joe Luca, Dean Graduate Research School and Professor William Stock, Associate Dean Research and Higher Degrees of Faculty of Health, Engineering and Sciences at ECU. I would also like to thank Professor Di Twigg, the head of Nursing and Midwifery School. I would also thank the staff of GRS. All appreciation and thanks for the nice persons Dr. Robyn Morris, Dr. Bev Lourie, Dr. Marie Lewis, Dr. Tapan Rai, Dr. Anna Golab, and Dr. Greg Maguire for their support.

I would thank my Uncle 'Mohammad Khalid Barahmeh', who died just few months before I completed this work and could not celebrate this event with us. All appreciation to the first man in my life, my husband 'Dr. Sirhan Barahmeh' for his support in this journey of suffers. I would thank my daughter 'Rose', and I would say sorry to her that I could not been with her in all her important events, so sorry Rose that I could not attend the surprising show for Mother's Day in the Kindegarden. I am so sorry that I have been busy with study all the time. I would also say sorry to my old son 'Ramiz', I left him in my home country, when he was less than two years old. My dear son, I hope this result will make you happy in future; I will never leave you again. I hope from now on we will live together, as one family with all loves and peaceful.

All appreciation and thanks for my older brother, Dr. Safwan Hammadneh, for encouraging me to take this journey and for support he provided me to the end. My parents, thank you for the love you provided and for all praying you made for me in the all difficult times. My entire family, brothers and sisters, I love you and I thank you a lot.

Shereen Hamadneh

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

- incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- contain any material previously published of written by another person except where due reference is made in the text of this thesis; or
- contain any defamatory material.

Shereen Hamadneh

Abbreviations

SIDS: Sudden Infant Death Syndrome

SE: SIDS Education

SEP: SIDS Education Package

JSEP: Jordanian SIDS Education Package

KAUH: King Abdullah University Hospital

PBTH: Princes Bade'a Teaching Hospital

PRTH: Princes Rahmeh Teaching Hospital

MCHCs: Maternal-Child Health Centres

WHO: World Health Organisation

PAR: Participatory Action Research

JUST: Jordan University of science and Technology

IRB: International Review Board

CEP: Continuous Education Program

UNICIFE: United Nations International Children's Emergency Fund

IDTP: Infant Discharge Teaching Plan

Chapter One – Introduction

Sudden Unexpected Infant Deaths (SUID) is a problem world-wide. SUID defined by Centre of Disease and conditions (2014, p. 1) as "deaths in infants less than 1 year of age that occur suddenly and unexpectedly, and whose causes of death are not immediately obvious prior to investigation" (CDC, 2014, p. 1). Sudden Infant Death Syndrome (SIDS) is the main leading cause of SUID, and each year in the US, about 4,000 infants die with SUID and half of them are due to SIDS (CDC, 2014). SIDS defined as "the sudden death of an infant less than one year of age that cannot be explained after a thorough investigation is conducted, including a complete autopsy, examination of the death scene, and review of the clinical history" (CDC, 2014, p. 1).

SIDS rates were dramatically reduced in Western countries, of less than 0.55 per 1,000 births in US, Canada, Australia, UK, Germany, Sweden and France (Hauck & Tanabe, 2008a, 2008b; Yikilkan et al., 2011a). In contrast, this is still high in the Middle East counties (Abdulrazzaq, Kendi, & Nagelkerke, 2008a; Bataineh, Shawagfeh, et al., 2008; Eisenstein, Ben-Yehuda, Shemesh, & Kharasch, 2012; Nofal, Abdulmohsen, & Khamis, 2011a; Van-Sleuwen, L'Hoir, Engelberts, Westers, & Schulpen, 2003b). For example, SIDS rate was high as 1.32 per 1,000 live births and contributed 6% to the infant mortality rate in North Jordan (Bataineh, Shawagfeh, et al., 2008). In UAE, SIDS rate was 0.66 per 1,000 live births and contributed 7% to the infant mortality rate (Abdulrazzaq et al., 2008a). Furthermore, SIDS was the second cause of infant deaths in Iraq (Awqati et al., 2009).

Research into SIDS deaths has shown that influencing lifestyles and infant care practices among families has potential to reduce the incidence of SIDS (NICHD, 2013a). Many SIDS education campaigns are available in western countries and provide the education for healthcare providers, parents and child caregivers. These campaigns have significant impact on SIDS statistics and improved SIDS-safe sleep practice among parents, caregivers and healthcare providers (American Academy of Pediatrics, 2011a)For example, the 'Back to Sleep' or BTS program, started in 1994, aimed to educate parents and caregivers, as well as healthcare providers, regarding SIDS-safe positioning practices. This program has successfully decreased the incidence of SIDS. Since the program started, the SIDS rate in the

US had fallen by more than half by 2006 (CDC, 2010; Trachtenberg, Haas, Kinney, Stanley, & Krous, 2012a).

This study focuses on Jordan, a developing country in the Middle East. Research has shown that most modifiable SIDS risk factors can be reduced by increasing knowledge, changing parental behaviours and practices regarding SIDS risks and relevant prevention recommendations (Darrah & Bartlett, 2013; Mitchell & Blair, 2012; Moon & Omron, 2002; Trachtenberg, Haas, Kinney, Stanley, & Krous, 2012b). However, there has not been a major investment in educating Jordanians about SIDS risks and SIDS prevention measures. Educating healthcare providers has been shown to have a significant impact on SIDS deaths through their transfer of SIDS information and advising families (American Academy of Pediatrics, 2013; Aris et al., 2006; NICHD, 2013a). In Jordan, healthcare providers are routinely identified as an effective education and training group for health promotion among Jordanian community, as they have played an effective role in a number of campaigns for maternal-child health promotion in the country, including infant immunisation, family planning and breast feeding which effectively influenced parents' and families' behaviours in Jordan (Khalaf et al., 2009; Ministry of Health-Jordan, 2013). Similarly, for this SIDS-education project, it is expected that healthcare providers can be instrumental in effectively delivering SIDS education and prevention information to families visiting the heath institutions as well as to families they meet during regular daily life within their community. This study aimed to determine whether a targeted and tailored Jordanian SIDS education package (JSEP) would result in healthcare providers improving their parenting education and training practices regarding SIDS in a major Jordanian hospital. The long-term goal of this research was to influence lifestyles and infant care practices in Jordan to reduce the incidence of SIDS.

1.1 BACKGROUND

1.1.1 SIDS risk factors

While the cause of SIDS is still unknown (Moon, Horne & Hauck, 2007), researchers have identified several risk factors linked to prenatal and pregnancy outcomes, other factors linked to infancy, and still others associated with infant care practices and home environments. Prenatal and pregnancy risks include maternal smoking, alcohol use, drug abuse, and sedating

medications (Pelayo, Owens, Mindell, & Sheldon, 2006); inadequate prenatal care (Kraus, Greenland, & Bulterys, 1989), inadequate prenatal nutrition (Henriksen, 1999), and short inter-pregnancy intervals (Spiers & Wang, 1976), and the risk is greater with teenage mothers (American SIDS Institute, 2011). Newborns with health problems, such as Intra Uterine Growth Retardation (IUGR), Low Birth Weight (LBW), Small for Gestational Age (SGA), prematurity, and preterm are all associated with a higher risk of SIDS. Furthermore, the highest SIDS incidence is associated with infants aged from two to six months, infants suffering from anaemia, infants with lack of breastfeeding, and male infants (AAP, 2008; American Academy of Pediatrics, 2011a; American SIDS Institute, 2009; Athanasakis, Karavasiliadou, & Styliadis, 2011; Morrison et al., 2012; Nabukera et al., 2008).

Postnatal factors related to infant sleep care practices and home environment have also been associated with a higher risk of SIDS. These risk factors include mouldy environment, tobacco smoke exposure, elevated or reduced room temperature, excess bedding, excess clothing, sleeping caps, soft sleep surface and loose bedding, side or prone sleep position, co sleeping, bed sharing, or adding other soft objects to the infant's bed such as stuffed animals, pillows, quilts, blankets, sheepskins and fleeced, wedges, and bumper pads (American Academy of Pediatrics, 2011a; Athanasakis et al., 2011; Bruce, Perez-Padilla, & Albalak, 2000; Emmelin & Wall, 2007; Etzel, 2007; Glinianaia, Rankin, Bell, Pless-Mulloli, & Howel, 2004; Moon & Fu, 2012; Tong & Colditz, 2004; Vargas et al., 2000). It also appeared that the incidence of SIDS increases during winter months (American Academy of Pediatrics, 2011a; Harris et al., 2012; Leach et al., 1999b; NICHD, 2006, 2013b).

1.1.2 SIDS prevention recommendations

Since this syndrome was recognised in the mid-20th century, developed countries have enacted a variety of programs to reduce the incidence of SIDS. Healthcare providers have been identified as a group with a critical role in health promotion and health education programs including SIDS (NICHD, 2010; American Academy of Pediatics, 2011). Healthcare providers in western countries are aware of SIDS risks and SIDS prevention measures and routinely educate parents and caregivers about these risks and prevention measures. As this has increased knowledge, changed risk practices, and decreased hazards at homes resulting in decreased SIDS rates in developed countries. SIDS prevention recommendations from recent literature and research on SIDS, including the American

Academy of Pediatics or AAP (2011), the American SIDS institute (2009) and the SIDS and Kids Australia and National Institute of Child Health and Human Development or NICHD (2010), have been used worldwide to decrease the identified modifiable risk factors for SIDS. Foremost among the improved practices include having pregnant women access healthcare as early as possible in their pregnancy and having regular pregnancy check-ups and balanced diets. Pregnant women are also advised to stop smoking, avoid tobacco smoke exposure, and avoid using alcohol or any sedatives or other substances during their pregnancies. Reducing SIDS risks during infancy involves keeping homes smoke free, sustaining breastfeeding, and providing infants with pacifiers at bedtime. In terms of infant sleeping and waking positions, parents and caregivers are advised to put infants to sleep in supine positions and to position infants on their stomachs only in wakeup time and only under supervision. In terms of bedding, only infant clothing and bedding materials made from cotton and other natural fabrics, using sleeping sacks as infant sleepwear, and using firm bedding rather than loose bedding are recommended. It is also recommended avoiding the use of pillows, wedges, bumper pads or heavy blankets in the infant's bed, and avoiding placing toys, soft objects, or stuffed animals in the infant sleep space. Parents and caregivers are asked to refrain from use of excessive bedding and clothing, to refrain from sharing beds with infants and co-sleeping, and to refrain from swaddling infants with non-cotton wrappings.

1.1.3 SIDS in developed countries versus developing countries

Despite the extensive research conducted on SIDS and many campaigns on SIDS prevention implemented in Western Countries, little effort has been given to SIDS research and prevention in Middle Eastern countries. The few studies conducted on SIDS in the Middle East have highlighted pressing needs for a SIDS prevention program in the region (Abdulrazzaq, Kendi, & Nagelkerke, 2008b; Bataineh, Hussein Shawagfeh, et al., 2008; Efe, Sarvan, & Kukulu, 2007; Inbar et al., 2005; Van-Sleuwen, L'Hoir, Engelberts, Westers, & Schulpen, 2003a). In the interest of reducing avoidable infant deaths, it appears vital to educate parents in the Middle Eastern Countries about SIDS risk factors and alert them to the most recent prevention recommendations.

The lack of awareness of SIDS risk factors and prevention practices in developing nations like Jordan extends to the healthcare workforce (Bataineh, Hussein Shawagfeh, et al., 2008). Although Middle Eastern governments require their healthcare providers to educate families

about nutrition, hygiene, benefits of breast feeding, and how to reduce the risk of infection; these healthcare providers rarely offer families any advice on SIDS prevention measures. Having a SIDS prevention program remains a novel idea in the Middle East region. Healthcare providers within the region currently lack sufficient knowledge about SIDS, and SIDS prevention measures themselves, to enable them to play a role in effectively educating families regarding SIDS. Implementing a SIDS education package for health care providers therefore has potential to create a ripple of change that will lead families to adopt SIDS safe practices and have a safer and healthier home environment.

1.2 JORDAN

Jordan is a developing country in the Middle East, officially known as the Hashemite Kingdom of Jordan (Figure 1.1). Jordan is one of the Levant region countries or Syria historical 'Al-Sham', which includes Syria, Jordan, Lebanon, Palestine, Israel and parts of southern Turkey. The Levant region shares a similar geography and culture, and hence, acts as a potential base for the generalisation of socio cultural research. Its most widely spoken language is "Jordanian Levantine," a derivative of Arabic with English, French and Turkish influences, reflecting Jordan's history under French, British, and Ottoman (Turkish) rule (Al-manasaire, 2011).

1-1: Map of Jordan

Jordan is a small country with an area of only 89,213 square kilometres (KM^2). Jordan is smaller in size than its neighbouring countries of Syria (185,180 KM^2), Iraq (437,072 KM^2) and Saudi Arabia (2,149,690 KM^2), but it is larger than both Palestine and Israel (26,790 KM^2). In addition to Jordanian families, there are also many Palestinian, Syrian, and Iraqi families living in Jordan. The population of Jordan is 6.4 million and growing at a rate of 3% per year (DOS, 2013). Around fourteen percent of Jordanians are unemployed (DOS, 2013). Both the population and the unemployment rates are expected to increase due to increasing numbers of Syrian refugees. Jordan lacks the oil, gas and electricity of the wealthy Middle Eastern countries (Index mundi, 2013), which contributes to its economic problems. As Sharp (2013, p. 2) noted, "the country's small size and lack of major economic resources have made it dependent on aid from Western and friendly Arab sources". The overwhelming majority of Jordanians struggle to provide themselves with the essentials of life.

Geographically, Jordan is a mixture of deserts, highlands and plains. Jordan has a Mediterranean climate and snow falls in the Jordanian highlands during winter (November to April). In the desert, the winter can be bitterly cold, especially during the night (Metz, 1989), With temperatures ranging from -1 to -6 overnight. Jordanian winters have recently become colder; with the winters of 2011 to 2013 were the most severe in the last twenty years. Winter floods and snow are also increasingly more common, with the damage caused further contributing to the region's current economic crises making heating homes and keeping children warm and comfortable during winters increasingly difficult.

1.2.1 Jordanian community and infant care practice

Community in Jordan is known as being very social and open, especially for families living in rural and remote areas. Jordanians are distinguishable by their hospitality (Brown, 2013). Families celebrate events in their homes, and the arrival of a newborn infant triggers repeated visits from relatives, friends and other people from the home town, especially during the first 40 days of the newborn's arrival. Culture, religion and lifestyle encourage large families and early marriages. It is common for families in Jordan to have at least six children, and families in rural and deserts could have ten or more children. Unfortunately, short inter-pregnancy intervals and a lack of antenatal care both increase the risk of SIDS.

Grandmothers, friends and other relatives all provide a variety of advice on infant care practices based on their own life experiences and local traditions. Although mothers in Jordan access infant healthcare information mainly through information derived from female relatives, they also obtain health care information from health professionals, television, and community interaction. While mothers are the primary infant caregivers, it is also very common for female relatives to provide the infant care among their families. In Jordan and other neighbour countries, it is also a very common and acceptable practice for the oldest children within a family to act as infant caregivers, especially where the mother has many other children or is working, studying, ill, or deceased (Figure 1.2). Changing infant care practices therefore requires the involvement of the extended family with the added difficulty of changing long held beliefs and traditions.

1-2: Grandmothers and oldest children are known as groups of caregivers for infants in Jordan (Photographs for families in Jordan taken by the researcher and some downloaded from UNICEF website)

1.3 INFLUENCE OF RELIGION, CULTURE AND ENVIROMENT ON SIDS PREVENTION EDUCATION

The Islamic religion is an important influence on child care practices in the Middle East, including Jordan. Ninety percent of Jordanians are Muslim and the primary branch is Sunni (DOS, 2013). Qur'an is the central religious text of Islam and believed by Muslims to be the book of divine guidance and direction for mankind. They also consider the text in its original form to be the literal word of Allah and view the Qur'an as God's final revelation. Sunnah is an Arabic word meaning habit or usual practice, and is the second source of Islamic legislation which must be in complete agreement with the first source (the Quran). The "Sharia of Islam" (Islamic law) is based on both Quran and Sunnah (Islam today, 2013).

Muslims are expected to follow the Shariah guidelines for human wellbeing. The Islamic religion encourages lifelong learning and encourages people to work to the best of their ability. According to Sharia, Muslims have a responsibility to seek new knowledge and making it available to the community (Al-Maghmsi, 2010; Islam today, 2013), while following the word of Allah in order to receive his gratitude and blessings. These values and beliefs would appear to support the idea of educating health care providers and encouraging them to educate parents and caregivers.

There are many concepts of death in Islam from Qur'an and Sunnah. Muslims believe that death occurs by 'gader' (fate or destiny), it is the will of Allah and they are therefore powerless to prevent it. Nevertheless, they have an obligation to provide the best quality care for their infants in order to meet their Sharia obligations (Al-ashgar, 2005). Both Qur'an and Sunnah regulate dealings with children from preconception stages through the foetal stage to the birth, and for each stage of childhood life (Safyani, 2013). For example, it is recommended that mothers continue breastfeeding for about two years, if possible. When the biological mother is unable to breast feed, a 'wet nurse' can feed the infant, with the parent agreement (Shaikh & Ahmed, 2006). Families are encouraged by their religion, culture and traditions to maintain breastfeeding and are aware about the benefits of breast feeding. In terms of SIDS prevention, this is a positive behaviour. Nowadays, changing lifestyles and the numbers of Jordanian women working and studying have reduced breastfeeding rates in Jordan. Health care providers continue to support Jordanian mothers initiating and maintaining breastfeeding.

Parents and caregivers in Arabic cultures usually sleep in the same room as their infants, but on a separate sleeping mattress. Unlike this practice, which does reduce the risk of SIDS, bed sharing heightens the risk of SIDS. Some mothers do, however, share their beds with their infants while they are breastfeeding, and particularly in cold weather, as this makes it easier for the mother to stay bonded with her infant and provide regular breastfeeding.

Despite the cold winters, Jordanian homes tend to be both poorly ventilated and poorly heated, relying on the traditional heating resources shown in Figure 1.3. Windows and doors are kept closed throughout the entire winter season, the peak season for unexplained infant deaths. To date, there has been little investigation of the number of unexplained infant deaths occurring in Jordan during winters, with (Khoury & Mas'ad 2002, p. 432) reporting "Jordan lacks accurate information on mortality and related indicators. Reporting of infant deaths is defective". The mould appears in homes during winter months, this related to increasing the humidity during winters and nature of Jordanians' homes. Mould, poor ventilation and poor heating are, however, known risk factors for SIDS, which is more common during winter months. While families are aware that infant deaths are more common in Jordan's winter, more could be done to educate parents about the relevant risk factors and the preventive measures.

1-3: Photos shows the most popular heaters in Jordan (kerosene, gas and wood)

In cold weather, and especially in winter, families in Jordan often dress their infants in heavy clothing and hats or nightcaps as well as swaddling them with many layers of quilts, as shown in the Figure 1.4. In winter, parents also add warm mattresses and furs and fleeces such as sheepskins to infant beds, which can make infant overheat. These practices can increase the risk of SIDS.

1-4: Differences in infants' beds and bedding practices in Jordan and Australia. The photograph on the left shows an infant sleeping on its back without a hat with a light covering was downloaded from the SIDS & Kids website. The other photographs, taken by the researcher

As shown in Figure 1.5, "*Alghmatte*", the traditional swaddling/clothing used six months-round for infants in Jordan, is a way to keep infants warm with only light clothing. Alghmatte is used in homes and in maternal and neonatal units in Jordan. Healthcare providers regard Alghmatte as a safe practice because the infant is unable to move and shift the bedding over their faces. Alghmatte is usually made from a comfortable, light, soft, pure cotton mattress, is inexpensive and readily available in stores. The Alghmatte resembles infant sleeping sacks recommended and used in western countries to reduce SIDS risks. However, some families tend to swaddle infants using unsafe swaddling practices which are associated with a range of health risks, including SIDS. For example, in cold weather, families tend to swaddle infants under six months in multiple layers of swaddling, dress them in heavy clothing, and put them to bed under heavy blankets. They also wrap the infant's body along with its head. Neither of these practices can be considered SIDS-safe. Families need to be educated about safe swaddling practices.

1-5: Alghmatte, the traditional swaddling in Jordan

Sleep Positioning. Arabic parents and caregivers do not usually place their infants on their stomachs (prone position) to sleep. Their awareness of the infant death risks associated with prone position promotes this SIDS safe practice. A less SIDS safe practice, namely having infants sleep on their sides is, however, also quite commonly used for infants in Jordan. Parents and caregivers in Jordan believe that in the first few months of life, infants should be placed in a variety of positions (back and sides) in order to prevent "flat head". They also put infants on their side after they have been fed to prevent suffocation from vomiting. Healthcare providers also use the same practices at home and recommend these practices to parents and caregivers. Side sleeping, especially in the first six months of life, is nevertheless now considered to increase the risk of SIDS.

In Jordan, where families are large, the children and young infants commonly sleep on mattresses placed directly on the floor, rather than on a bed frame. Parents in Jordan believe that adding objects like pillows, bumper pads and wedges to the infant's sleeping space reduces the risk of sudden death. Families believe pillows are essential for propping up the infant's head to keep its airways open during sleep. Bumper pads and wedges prevent infants from hurting themselves on the walls also prevent them rolling over into a prone position.

In Jordan, it is also customary for parents to place infants to sleep on soft bedding and to place stuffed animals, soft clothing, quilts and blankets on their infants' spaces, (see Figure

1.6). Parents and caregivers also often place a ‘Namlieh’, a soft, light fly veil over infant’s face to keep flies away. Jordanian parents lack the widespread awareness in western countries, that loose bedding and soft objects, such as stuffed animals, pillows increase the risk of SIDS and suffocation.

1-6: Differences in infants’ beds and bedding practices in Jordan and Australia. The photograph in the left showing the safe practice of infants sleeping on its back in light clothing on firm bedding without ready access to any soft objects was downloaded f

Families are less aware of the health hazards associated with smoking and like other Middle Eastern Countries, Jordan has far fewer governmental and cultural restrictions on smoking inside homes than in do Western societies. People still smoke inside homes and in public settings and public transportations. While in western countries such as Australia used strategy of increasing tobacco prices. The cost of tobacco is currently very low in Jordan (e.g. 25 cigarettes cost less than AU$2) and is decreasing. Tobacco smoking in the Middle East countries such as Jordan also includes the use of “Argileh” (water pipes, see Figure 1.7). Tobacco for the Argileh costs less than a litre of milk. People often share Argileh, especially at social events within the family settings.

1-7: Argileh smoking

It would appear that the high incidence of both active and passive smoking in homes in Jordan heightens the risk of SIDS. Jordan has the highest smoking rate in the Middle East, and is among the top twenty countries for smoking in the world (WHO, 2009b). The incidence of smoking among Jordanian adults is, for instance, reported to be 61% for men and 10% for women (WHO, 2009a, p. 18), and increasing (Haddad et al., 2011). As smoking is very common among Jordanian men, pregnant women are often exposed to smoke in their homes by their husbands (Abu-Baker, 2005; Haddad et al., 2011). The high incidence of pregnant women smoking has also become a cause for concern with Najdawi and Faouri (1999) reporting that 19% of women in Jordan smoked during pregnancy and more recent by Azab et, al (2013) conducted a study in North and Middle Jordan among sample of 500 pregnant women and found:

> 7.9% of women were current cigarette smokers and 8.7% were current water pipe smokers. About 82.4% of all women reported that they are exposed to cigarette smoke and 32.8% reported that they are exposed to water pipe smoke (Azab et al., 2013, p. 231).

Active and passive smoking during pregnancy increase the risk of SIDS. It also associates with Low Birth Weight (LBW) infants, who have four times higher risks of SIDS than the normal birth infant.

Exposing infants to tobacco smoking is also acknowledged risk factors for SIDS and the risk increases when smoker parents share their adult bed with infants. Jordanian infants are often exposed to smoke in their homes by their smoker fathers (Hawamdeh, Kasasbeh, & Ahmad, 2003). This risk would be greater in winter and increased by social events such celebration

for a newborn infant in family, when presence of more than one smoker around the infant. Jordanians, lack of knowledge about the SIDS risks associated with smoking is cause for concern, as it contributed to avoidable infant deaths.

1.4 THE JORDANIAN REGION BEING STUDIED

This study focuses on the researcher's home region, North Jordan, a complex of desert, rural and highland areas. This region has two major cities, Irbed and Al-Mafraq. Irbed includes many rural villages, while most of Al-Mafraq is desert. The following photographs show the landscape of North Jordan (Figure 1.8).

1-8: The geographic of northern remote rural villages in Jordan (the researcher's home town, photos taken by the researcher).

North Jordan has a Jordanian population of around 1,4 million (DOS, 2011). In addition there are almost a million Syrian refugees, including almost half million children (UNHCR, 2013a, 2013b). The population of the Northern Jordanian desert is largely tent-dwelling Bedouin and refugees (Figure 1.9).

1-9: Families living in tents and camps in Northern Jordanian desert

Health care providers in North Jordan are well positioned to explain the relevant SIDS prevention measures to families. North Jordan has seven well established public hospitals, as well as large number of private hospitals, with a particular focus on maternal-child birth services. Neonatal care services are mainly provided by the public hospitals, especially the major teaching hospitals, namely King Abdullah University Hospital (KAUH), Princess Badde'a Teaching Hospital (PBTP) and Princess Rahmeh Teaching Hospital (PRUH). Jordan also has more than 150 Maternal Child Health (MCH) centres (WHO, 2013b). As it is accepted practice in Jordan, for women to leave hospital as soon as possible after giving birth, Jordanian mothers go to their local MCH for pregnancy follow up, infant immunizations, family planning purposes and contraception management (WHO, 2013b). These MCH centres have a major role in education, delivering what is termed 'Prevention Education'. Despite a study conducted in a public hospital in Irbid finding the mortality rate related to SIDS was 6.3% (Bataineh, Hussein Shawagfeh, et al., 2008), North Jordan still has no education program about SIDS.

1.5 PROBLEM STATMENT

Research on SIDS in Western nations has shown that the main causes of infant mortality are preventable (WHO, 2013a), similar in Jordan (Bataineh, Hussein Shawagfeh, et al., 2008). Intervention required to prevent the risk factors of infants' death due to SIDS (Khoury & Mas'ad 2002). Strong measures are needed to improve the level of knowledge regarding SIDS and to change attitudes regarding the adoption of SIDS-safe care practices. Bataineh et al, (2008) concluded that:

> Not enough is known about SIDS to suggest appropriate preventive measures. The present data show that about 75% of the deaths were due to preventable causes . . . Improvements in prenatal care, neonatal care and

> adverse environmental factors will prevent many of the cases (Bataineh, Hussein Shawagfeh, et al., 2008, p. 10).

It appears that infant deaths could be reduced if Jordanian parents and caregivers received timely, relevant and culturally appropriate education about SIDS. Culture, religion, environment, socio-economic factors influence both the need for SIDS education, and the means of delivering effective SIDS education in Jordan. Climate, certain infant care practices (beds and bedding), home environments (smoking, ventilation and heating) and lifestyle incorporate many known SIDS risk factors. Jordanian women have short inter-pregnancy intervals and large families which affect the antenatal care and this may increase the risk of SIDS. Widespread passive smoking in the homes heightens the risk of SIDS. Despite these identifiable risks, Jordanians lack both an understanding of SIDS and SIDS prevention measures. Unlike their counterparts in many western countries, Jordan's health care providers do not currently provide advice on SIDS risks and the prevention measures. SIDS is not included in education programs available in Jordanian health care setting.

A feasible and effective Jordanian education program about SIDS could not simply replicate western-style SIDS education and would need to take account of local culture, social, economic, religion and environmental factors. It can, however, build on the network of health care educators and health care services already available in Jordanian health care settings. Involving the health care providers in community SIDS education has potential to make a major impact on reducing the risk of SIDS. Health care providers can support the SIDS prevention by delivering the advice to the community members. Health care providers can teach parents and caregivers who visit the health institutions and they can advise families in their own surrounding community during daily life. The SIDS risk could be discussed with parents and families prior to pregnancy, during pregnancy and after the birth of an infant, especially if the mother is a smoker or is exposed to smoke in the home. Strong measures are needed to improve healthcare providers' knowledge of SIDS and to change their attitudes regarding SIDS risks and suitable education for families on SIDS-safe practices.

Jordan's most relevant health care providers are the nurses and midwives, who have frequent direct contact with families and the surrounding community, and are regarded as trusted resource for health care advice. At present, Jordan's nurses and midwives still lack an understanding of SIDS and the relevant preventive measures. Educating nursing and

midwifery staff about SIDS can impart important health benefits, offer opportunities for participants to improve both their knowledge and attitudes regarding SIDS prevention and infant sleep care practices, and enhance their communication skills with regard to SIDS prevention advice. Suitably educated staff could improve long-term outcomes for SIDS through improved community practices arising from SIDS risk-prevention advice to parents and caregivers. In addition, an effective SIDS education package for North Jordan has potential for application in other hospitals throughout Jordan and the Middle East.

1.6 AIMS AND OBJECTIVES

This study aimed to determine whether a targeted and tailored Jordanian SIDS education package, or JSEP, would result in neonatal healthcare providers improving their parenting education and training practices regarding SIDS in a major Jordanian hospital. Both quantitative and qualitative measures were used to assess the feasibility and effectiveness of the JSEP and the changes introduced. The objectives were to:

1. Develop a Jordanian SIDS Education Package (JSEP) and present it to neonatal healthcare providers in a major hospital in Jordan.

2. Assess the impact of the JSEP on infant sleep positioning practices as enacted by neonatal healthcare providers while in hospital by conducting a cross-sectional observation of sleeping positions in all infants' cots at the hospital, before and after implementation of the JSEP (quantitative assessment).
3. Assess the impact of the JSEP in terms of the alteration knowledge, accessing information, and parental education practices regarding SIDS prevention practices among sample of Jordanian neonatal healthcare providers, using a pre- and post-test questionnaire (quantitative assessment).

4. Explore and describe the neonatal healthcare providers' perceptions of undertaken the JSEP and shield light on challenges and suggestions for further improving the program, by conducting focus groups after the implementation of the JSEP (qualitative assessment).

1.7 SUMMARY

This chapter outlined the study background, the significance of the problem of SIDS education and incidence in Jordan, the problem statement, and the main aim and objectives. Chapter two presents the literature review conducted for this dissertation describing the evidence base for a SIDS education and the issues and challenges such an intervention must address. Chapter three presents the methods regarding the development, implementation and evaluation of a Jordanian SIDS education program, the study sample, data analysis plan, and how to the internal and external validity of the study were addressed. Chapter four presents the findings from the two data collection phases of the project: the baseline observational phase and the program evaluation phase. Chapter five presents the discussions of the study conducted. Chapter six presents the conclusion and recommendations of the study.

Chapter Two - Literature Review

The last chapter outlined the focus of this study. This chapter reviews the current literature regarding SIDS history, risk factors and recommended prevention measures. This chapter provided examples of SIDS prevention campaigns in Western countries also sheds light on the roles healthcare providers can play in SIDS prevention. In addition to providing baseline evidence to use in creating an effective SIDS education package for use in Jordan, this chapter also discusses relevant theoretical frameworks for both the study and the research questions.

2.1 SIDS HISTORY

Until as recently the 1970s, the sudden infant deaths now attributed to SIDS were attributed to a variety of causes, such as 'miasma' or 'an act of God' (Gandevia, 1978). Even in the mid-twentieth century, it was thought that many unexpected infant deaths were related to suffocation during sleep or aspiration of vomit (Barrett, 1954). With increasing medical knowledge, late twentieth century researchers linked these deaths to viral infection or anaphylactic reaction to milk (Parish, Barrett, Coombs, Gunther, & Camps, 1960). Cooke and Welch (1964) did however find unexpected infant deaths or 'cot deaths' related to seasonal weather conditions, the social class of the parents, infant feeding habits and infant birth weights. In 1969, the term Sudden Infant Death Syndrome (SIDS) was first used in the USA, at the National Institute of Health's Second International Conference titled "Progress in Sudden Infant Death Research" (Mahler, 2004). While some findings from the early research on the causes of SIDS have now been disproved, SIDS is now acknowledged as the third leading cause of overall infant mortality in the USA (NICHD, 2013a).

2.2 SIDS RISK FACTORS AND PREVENTION RECOMMONDATIONS

Although the cause of SIDS remains unknown (Moon, Horne & Hauck, 2007), researchers have recently identified several modifiable and unmodifiable risk factors. The unmodifiable risk factors are linked to genetic mutations and polymorphisms, brain abnormalities, respiratory and cardiovascular system abnormalities and disorders, and metabolic disorders (Athanasakis et al., 2011; Byard, 2001). Studies have found the incidence of SIDS higher among male infants than female infants (Athanasakis et al., 2011; Byard, 2001; Nofal, Abdulmohsen, & Khamis, 2011b; Vennemann et al., 2005). In 2011, the American Academy

of Pediatrics (AAP) released a list of modifiable SIDS risk factors and a series of recommendations to reduce these risks. The AAP's systematic reviews of the SIDS literature using the Pub Med database since 2005 (American Academy of Pediatrics, 2011b) concluded that most relevant modifiable risk factors included prenatal and infancy risks. Athanasakis, Karavasiliadou, and Styliadis (2011); and Moon (2012) also systymaticly reveiwed evidence for possible SIDS risk factors including environmental factors. The risk is further increased with combination of more than one risk factors (Athanasakis et al., 2011). All these modifiable factors and relevant prevention recommendations are discussed in detail below.

2.2.1 SIDS risk associated with pregnancy and relevant prevention recommendations

Intra Uterine Growth Retardation (IUGR), Low Birth Weight (LBW), Small for Gestational Age (SGA), prematurity, and preterm are all associated with a higher risk of SIDS (Athanasakis et al., 2011; Morrison et al., 2012; Nabukera et al., 2008). Greater risk of SIDS has been found for infants of mothers who use alcohol, abuse drugs, or use sedating medications during pregnancy (Athanasakis et al., 2011; Shankaran et al., 2007). Substance abuse during pregnancy increases the risk of prematurity and IUGR (Bada et al., 2005). Prematurity and IUGR are associated with foetal brain and respiratory development defects (Morrison et al., 2012), which leads to increased risk of respiratory distress syndrome and other recurrent respiratory tract infection after birth, and also increases the risk of SIDS (Athanasakis et al., 2011). Inadequate prenatal care, inadequate prenatal nutrition, and short inter-pregnancy intervals (less than one year) have also been found to increase the risk of SIDS (Athanasakis et al., 2011; Hauck et al., 2002; Henriksen, 1999; Kraus et al., 1989; Spiers & Wang, 1976). As inadequate prenatal care, inadequate prenatal nutrition and short inter-pregnancy intervals increase the risk of infants with IUGR, LBW, SGA, prematurity and preterm birth; it is not surprising that they put those infants at a higher risk of SIDS than full term infants with normal birth weight (Nabukera et al., 2008).

The risk of SIDS has also been found greater for infants of teenage mothers, less educated mothers and mothers with low socio-economic status (American SIDS Institute, 2011; Anderson, Johnson, & Batal, 2005; Athanasakis et al., 2011; Beckwith, 2003; Carroll-Pankhurst & Mortimer, 2001; Spencer & Logan, 2004). In addition, those mothers have a higher risk of having a foetus with growth and development problems such as IUGR, LBW, SGA, prematurity, and preterm. These mothers also usually have inadequate prenatal care

and are unaware of the key health care and nutrition recommendations regarding pregnancy (Bernabé et al., 2004). Very low socioeconomic status mothers and less educated mothers usually also have less pregnancy care and are exposed to more hazards than high socioeconomic status mothers and more educated mothers. The lack of knowledge and experience relating to pregnancy, infant care, and the parenting process among teenage mot hers appears to put their infants at a greater risk of SIDS (Spencer & Logan, 2004).

Maternal smoking and passive exposure to smoke during pregnancy are also among the major common risk factors for SIDS (American Academy of Pediatrics, 2011b; Anderson et al., 2005; Beckwith, 2003; CDC, 2014). Studies indicate that infants of mothers who smoke have almost five times the risk of SIDS compared with infants of non-smoker mothers (Switzerland., 1999). Smoking exposure, whether the pregnant woman is an active or passive smoker, significantly increases the risk for pregnancy and infancy outcomes such as preterm birth, prematurity, LBW, SGA, which have four times the risk of SIDS compared to normal weight and full term infants (American Academy of Pediatrics, 2000; Carmona, 2006; CDC, 2008, 2014). There is also an incremental risk of SIDS, especially for infants who remain exposed to smoke after birth (Carmona, 2006; CDC, 2014; Priest et al., 2008; Shah, Sullivan, & Carter, 2006). This risk increases when smoker parents share their adult bed with infants (American Academy of Pediatrics, 2005). According to the US Surgeon General's Report (2006):

> Infants who die from SIDS tend to have higher concentration of nicotine in their lungs and higher levels of cotinine [a biological marker for second-hand smoke exposure] than infants who die from other causes. .... In addition, babies of non-smoking women who are exposed to second-hand smoke during pregnancy are at risk for a small reduction in birth weight. Chemicals in second hand smoke appear to affect the brain in ways that interfere with its regulation of infants' breathing (Carmona, 2006, p. 180).

Therefore, pregnant women need to be encouraged to access healthcare service from early stages of pregnancy and have balanced diet. It is also important to discuss with pregnant mothers the factors can increase the risk of SIDS during pregnancy, including active and passive smoking and substance abuse (American SIDS Institute, 2011; CDC, 2008). It is also important to let the mothers know about the risks that associated with the short inter-pregnancy intervals. Parents need to be encouraged to have a Family Planning discussion

with their healthcare providers and keep at least one year between each pregnancy to decrease the infancy risk outcomes (Ugboma & Onyearugha, 2013).

2.2.2 SIDS risks associated with infancy and relevant prevention recommendations

Other SIDS risks during infancy are associated with infant sleeping environments and infant sleeping care practices.

Infant Sleeping Environments

As Tong and Colditz (2004, p. 327) stated "A range of environmental factors may interact to contribute to the adverse health conditions conducive to SIDS". A relationship has been found between infant death and aspects of Indoor Air Quality (IAQ), such as high humidity, high temperature, presence of mould, levels of carbon dioxide (CO2), and levels of the higher dangerous carbon monoxide (CO1), and other dangerous toxins resulting from burning wood, kerosene and gas or from smoking tobacco (Bruce et al., 2000; Emmelin & Wall, 2007; Glinianaia et al., 2004; Tong & Colditz, 2004). Not only is low IAQ known as risk factor for SIDS, but this risk also increases when ventilation is poor (FIMR, 2005). While smoking in infant environment increases the risk of SIDS, a smoker sharing the sleeping surface with an infant further increases this risk (APA, 2011a; Carpenter et al., 2013; Pelayo et al., 2006)

The risk of SIDS has been shown to be seasonal with the highest incidence of the SIDS deaths occurring during winter months (APA, 2011a; Leach et al., 1999a).This may linked to IAQ that results from less home ventilation from basic heating resources. It may also link to humidity and the growth of moulds. Mould has been found to be harmful and is significantly associated with SIDS as it can cause bleeding of the lungs (Etzel, 2007; Vargas et al., 2000).

As improving the IAQ is recommended to reduce the risk of SIDS, families need education to improve their awareness of these risks and to adopt less hazardous practices in their homes. In the USA, the decreasing prevalence of indoor home smoking during the period 1995-2006 impacted positively on that nation's SIDS rate: "For every 1% absolute increase in the prevalence of smoke-free homes with infants, SIDS rates decreased 0.4% from 1995 to 2006, controlling for supine sleep position" (Behm, Kabir, Connolly, & Alpert, 2012, p. 16).

The risk of SIDS increases with a sleep environment involving an elevated or reduced room temperature (Blair, Mitchell, Heckstall-Smith, & Fleming, 2008) and it has been recommended to keep room temperatures balanced between 65-70 Fahrenheit in order to reduce the risk of SIDS (Burd et al., 2007). The risk of SIDS increases with excessive CO2 exposure, so it is recommended enhancing the IAQ and home ventilation to lower the infant death risk. (Emmelin & Wall, 2007; Ferng & Lee, 2002). Families with young infants need to be aware about the SIDS risks associated with low IAQ. Smokers need to be encouraged to refrain from smoking inside their homes or around infants and to refrain from sharing a sleep surface with their infants.

Infant Sleeping Care Practices

Risks associated with infant care practices include infant sleeping positioning practices, infant bedding practices, infant swaddling and clothing practices, bed sharing practices, and lack of breastfeeding.

Positioning

Both the prone and side sleeping positions increase the risk of SIDS and can result in hypercapnia and hypoxia if the infant breathes the gases resulting from its exhalation (American Academy of Pediatrics, 2011b; Kanetake, Aoki, & Funayama, 2003; Kemp, Livne, White, & Arfken, 1998; Kemp & Thach, 1995; Patel, Harris, & Thach, 2001). The prone position is, however, associated with a higher risk of SIDS than the side sleeping positions (American Academy of Pediatrics, 2005; Grazel, Phalen, & Polomano, 2010a). According to the AAP:

> The prone position ... increases the risk of overheating by decreasing the rate of heat loss and increasing body temperature compared with infants sleeping supine. Recent evidence suggests that prone sleeping alters the autonomic control of the infant cardiovascular system during sleep, particularly at 2 to 3 months of age, and can result in decreased cerebral oxygenation... The side sleep position is inherently unstable, and the probability of an infant rolling to the prone position from the side sleep position is significantly greater than rolling prone from the back. Infants who are unaccustomed to the prone position and are placed prone for sleep are also at greater risk than those usually placed prone . . . (American Academy of Pediatrics, 2011b, p. 1345)

The supine infant sleeping positions is therefore recommended for every infant sleep period throughout the day and night, especially for high risk infants; such as preterm, LBW and

premature infants. The combined effects of sleeping position (sleeping in a side-lying position) and prenatal risk factors, infants with IUGR, LBW, premature, or preterm infants increase the risk of SIDS and the risk doubles when these infants are positioned in the prone position (Oyen et al., 1997). For full term healthy infants, the highest SIDS incidence (90%) is associated with infants aged less than six months; with the peak of SIDS incidence between one to four months (American Academy of Pediatrics, 2011b). This risk is higher among infants with IUGR, LBW, premature, or preterm and continues to eight months of age (Oyen et al., 1997). So giving more attention to sleeping practices of infants during their first few months of life could reduce the risk of SIDS and extra care will need for infants with IUGR, LBW, premature, or preterm.

Parents and caregivers should be advised about the SIDS-safe sleep position and be encouraged to only use supine sleep positions for their infants at home. The supine infant sleeping positions is recommended for all day or night sleep periods at home and in the hospital for healthy and medically stable preterm or full term infants. The supine sleep position appears to reduce the risk of SIDS by enhancing the sleeping arousal, so the infant requires less stimulation to awaken (Heinig & Banuelos, 2006). Horne, Sly, Cranage, Chau, & Adamson (2000) also stated:

> The incidence of sudden infant death syndrome has been found to be consistently higher in preterm and low birth weight infants than in infants born at term. Failure to arouse from sleep is one possible mechanism for sudden infant death syndrome. (Horne, Sly, Cranage, Chau, & Adamson, 2000, p. 468)

During their hospitalisation In the neonatal intensive care unit (NICU), medically unstable premature and LBW infants sometimes have to be placed in non-supine sleeping positions for medical purposes and treatment (Aris et al., 2006). For example, premature infants connected to the ventilators sometimes are positioned on a prone to maintenance lung ventilation by optimizing oxygen transport and gas exchange, and also to strength chest muscles. The left side position is also used, as an alternative to the prone position for mild respiratory failure: “In oxygen-dependent preterm infants, both the left lateral and prone positions improve lung function by optimizing breathing strategy” (Gouna et al., 2013, p. 1133). When these infants become medically stable, it is recommended that they be placed in supine sleeping positions to reduce the risk of SIDS (American Academy of Pediatrics, 2011b). It is recommended for healthcare providers to explain to the families that the requirements of the non-supine

position were only for medical purposes in hospitalisation period for infant (Aris et al., 2006).

The supine sleeping positions for infants recommended for reducing the risk of SIDS, is, however, recognised as a possible cause of flat head (positional skull deformities positional plagiocephaly), especially among infants in their first few months of life. Using only the supine sleep position for newborns can cause flattening of the occipital fontanel in the skull (the back of the head), as staying in a supine position for too long involves constant pressure on the back of the head (Laughlin, Luerssen, & Dias, 2011; Speltz, Collett, & Stott-Miller, 2010).

> Since the early 1990s, US pediatricians have seen an increase in the number of children with cranial asymmetry, particularly unilateral flattening of the occiput, likely attributable to parents following the American Academy of Pediatrics "Back to Sleep" positioning recommendations aimed at decreasing the risk of sudden infant death syndrome (Laughlin et al., 2011, p. 1236)

To minimise the unfavourable side effects, such as flat head, resulting from constant supine sleep positions, SIDS prevention campaigns, such as SIDS and Kids (2011) have recommended placing infants on their tummies to play and only using the supine position for the infants night-time sleeping. This 'tummy time' also enhances the infants' development of motor skills. SIDS prevention campaigns nevertheless recommend that any use of the stomach position for unsleeping time must be supervised by the infants' parents and caregivers (SIDS and Kids, 2013a).

Bedding

The risk of SIDS increases with a soft sleep surface because an infant sleeping on a soft surface and/or with loose bedding may bury its face in the bedding or the sleep surface, which may result in a sudden death due to increased temperature and carbon dioxide near the infant's face (Moon, et al., 2007). It is recommended that parents use firm bedding for an infant's sleep surface (American Academy of Pediatrics, 2011b). In addition, using soft objects such as pillows and stuffed animals is not recommended, as it increases the risk of SIDS. Soft objects, heavy blankets and sheets in the infant's sleep surface are tucked in the bedding surface and can cause loose bedding (American Academy of Pediatrics, 2011b; Athanasakis et al., 2011). In addition, excessive bedding (layers of blankets and quilts),

sheepskins, fleeced and excessive clothing can increase infant's body temperature and heighten the risk of SIDS (American Academy of Pediatrics, 2011b; Athanasakis et al., 2011). Research also did not provide any specific level of body temperature could the risk of SIDS increase. It also recommend that head covering during sleep increases the risk of SIDS due to increased temperature and the infant may roll over and cover the face and lead to increase carbon dioxide which can cause suffocation. "Head covering is a major modifiable risk factor associated with SIDS deaths and parental advice to avoid this situation should be emphasised." (Blair et al., 2008, p. 778).

The risk of SIDS is higher for certain types of crib mattresses and bedding surfaces; such as sheepskin or sheep fleece underlay, moisture-resistant cot mattress protectors, any under-blanket which is not made of pure cotton, any acrylic blanket, any blanket which contains polyester, any bedding that is quilted, padded, or filled, any sleeping bag, doona. Sheppard, (2011) stated that the theory linked SIDS or cot death with bedding mattresses:

> …suggests that lethal toxic gases generated from crib mattresses can poison babies while sleeping. Toxic gases are created from the interaction of chemical fire retardant compounds with a fungus that commonly grows in mattresses and bedding. The gases are breathed and absorbed by a baby, shutting down the central nervous system and stopping breathing and heart function. Toxic gases are denser (heavier) than air, so the gases released from mattresses hover directly over the mattresses and diffuse away toward the floor. (Sheppard, 2011, p. 1)

Therefore, it is recommended to ensure that use SIDS-safe bedding practices, including use of a firm sleep surface, avoid using excessive bedding and clothing, and avoid using soft objects in the infant bed, such as pillows, stuffed animals. It is also recommended refraining from the use of sheepskins, fleeced, or nylon and polyester bedding materials (Aris et al., 2006; Quinn, 2002). Natural fabric, such as cotton it is highly recommended to reduce the risk of SIDS. A SIDS prevention campaign in New Zealand publicized the link between SIDS and bedding fabric and recommended that parents using proper bedding for SIDS prevention 'SIDS Safe Crib' (Sprott, 2004). Although there were 920 SIDS deaths in New Zealand between 1995 and 2010, none of these deaths involved a properly bedding fabric (New Zealand Ministry of Health, 2011).

Swaddling and Clothing

SIDS and Kids (2013) investigated the risk of SIDS with wrapping or swaddling an infant in fabrics and stated that non-cotton fabrics, such as polyester and nylon, increase the infant's body temperature and so increases the risk of SIDS. Similarly, Sprott (2004) suggests that combining wrapping or swaddling with un-safe SIDS positions (non-supine positions) increases the risk of SIDS (Sleuwen et al., 2007).

SIDS and Kids (2013) recommended safe infant sleep swaddling and wrapping that includes wrapping infants with a pure cotton sheet, using light cotton cloth under the wrap, avoiding use of heavy or multiple layers of wrapping, or putting a wrapped infant to sleep in a hat. Wrapping should only cover the infant's body and shoulders and not the infant's head or neck. These steps can reduce the probability of the infant suffocating or becoming overheated during sleep (Meyer & Erler, 2011). While swaddling can promote the favourable supine position (Sleuwen et al., 2007), combining swaddling with non-supine sleep positions is a very risky practice which can lead to sudden death (AAP, 2008; American SIDS Institute, 2011; Moon, 2010; SIDS and Kids, 2013a). Parents need to be advised to stop swaddling and wrapping any infants older than six months, as those infants may attempt to turn from back to front (from supine to prone), which increases the risk of SIDS (Sleuwen et al., 2007).

The APA (2008) recommended putting full term and preterm infants, including LBW infants, to sleep on their backs in an infant sack (available in the infants bedding markets). Use of a sleep sack is an important SIDS risk reduction strategy that keeps the infants warm without covering their heads and reduces the incidence of infants turning from back to front during sleep (L'hoir, et al., (1998). This recommended practice is similar to the Jordanian traditional infant wrapping arrangement called Alghmatte; both can reduce the risk of SIDS by preventing covering of the infant's face, and reducing the opportunity for the child to get caught up in the bedding or become over heated or under heated in the bedding (AAP, 2008; American SIDS Institute, 2011; Moon, 2010). It is recommended not to place the infant in a completely isolated room during night sleep time or day naps (Ferng & Lee, 2002). Infants need to be adult supervision. "SIDS can happen at any time of the day and relatively quickly. Parents need to be made aware that placing infants supine and keeping them under supervision is equally important for day-time sleeps" (Blair, Platt, Smith, & Fleming, 2006, p. 1563).

Bed Sharing, Breastfeeding and Pacifiers

The practice of bed sharing with infants have been shown to offer a range of benefits including increased likelihood of breastfeeding, parent-child bonding and management of sleeping related issues (Horsley et al., 2007). Bed sharing can, however, increase the risk of SIDS and this risk is higher when beds are shared with infants younger than four months (American Academy of Pediatrics, 2011b; Athanasakis et al., 2011). Although failure to breast feed is associated with a higher risk of SIDS (American Academy of Pediatrics, 2011b), mothers who breastfeed were twice as likely to share their bed with their infants (Ateah & Hamelin, 2008).

While it is important to encourage women to establish breast feeding early and to support them to maintain the breastfeeding, it is also important to advise breastfeeding mothers of the SIDS risks associated with bed sharing. The enhancement of breast feeding is acknowledged as an important step in keeping infants healthy and reducing the risk of SIDS. Recent research has shown that breast feeding decreases the risk of SIDS by about 50% (Connor, Tanabe, Siadaty, & Hauck, 2009; Vennemann, Bajanowski, & Brinkmann, 2009). Breast feeding enhances the infant's immunity system and decreases the occurrence of gastrointestinal and respiratory infections (American SIDS Institute, 2009).
In addition, several studies recommended that parents provide a pacifier at bed time to decrease SIDS risks (APA, 2011a; Connor et al., 2009; Mitchell, Blair, & L'Hoir, 2006), though the introduction of pacifiers is recommended only after breastfeeding is well established (Connor et al., 2009; Hauck, Omojokun, & Siadaty, 2005a; Hauck, Omojokun, & Siadaty, 2005b; Moon et al., 2007; Munsters, Wierenga, Boere-Boonekamp, Semmekrot, & Engelberts, 2013). According to Hauck (2005a, p. 721), "The pacifier should be offered to the infant when being placed for all sleep episodes, including daytime naps and night-time sleeps". The study by Franco et al. (2000), which evaluated the influence of a pacifier and breast feeding on reducing the SIDS risk among healthy infants, found the pacifier facilitated the sleep arousal so that an infant required less stimulation to awake. The study concluded:

> Infants using pacifiers during sleep had lower auditory arousal thresholds than those who did not use a pacifier during sleep. Breast-feeding could be a further factor contributing to lower arousal thresholds. These findings could be relevant to the occurrence of sudden infant deaths during sleep (Franco et al., 2000, p. 775)

A systematic review by Heinig and Banuelos (2006) explored the mechanism by which the pacifier could reduce the risk of SIDS concluded that:

> Pacifier use conferred significant protection against SIDS. Although the mechanism of such protection is unknown, it has been suggested that the use of a pacifier, similarly to the supine sleeping position, decreases the threshold for infant arousal, meaning that a child who is placed to sleep with a pacifier requires less stimulation to awaken (Heinig & Banuelos, 2006, p. 7).

In summary, Moon's (2012) systematic review based on strong research evidence affirmed recommendations to reduce the modifiable risk factors of SIDS:

> All infants should be placed in the supine position for every sleep. Tobacco exposure pre- and postnatally should be avoided. Room sharing without bed sharing is recommended. It is recommended that blankets, pillows, and other soft bedding be removed from the infant sleep area. Overheating should be avoided. Breastfeeding should be encouraged for SIDS risk reduction. Pacifier use should be encouraged for SIDS risk reduction (Moon, 2012, p. 314).

2.3 FAMILY SIDS EDUCATION PRACTICES

AAP (2011), American SIDS Institute (2009) and SIDS and Kids Australia and National Institute of Child Health and Human Development or NICHD (2010) recommended that healthcare providers use well established SIDS prevention recommendations to raise parents and caregivers awareness of SIDS risks and encourage them to change their risky practices. In most Western cultures, healthcare providers are included in SIDS-reduction campaigns In line with the massive literature supporting healthcare providers' roles in community health promotion and health education programs, health care providers can play an active role in improving the community infant healthcare practice and encourage SIDS-safe practices (American Academy of Pediatrics, 2011b; American SIDS Institute, 2009; Aris et al., 2006; Athanasakis et al., 2011; Grazel et al., 2010b; Wilson, 2008).

Delivering SIDS prevention information and advising parents and caregivers from early prenatal stages and through postnatal stages, can significantly reduce the risk of SIDS (Moon, 2010). Reducing the incidence of SIDS therefore requires ongoing education of parents and caregivers regarding the preventable and modifiable SIDS risk factors (Vennemann et al., 2005). The way in which parents manage the sleeping environment of their infant is highly

influenced by health care providers advice, as health care providers are usually considered as a trusted source of information for families, parents and caregivers (Wilson, 2008).

SIDS prevention measures need to be supported by the healthcare providers, who care for mother-infant from the prenatal stage through to the infant's first year of life (Gaffney, 2001). It is recommended that healthcare providers working with infants endorse and model the SIDS prevention measures significantly before the anticipated discharge of the infant (Gelfer, Cameron, Masters, & Kennedy, 2013). Healthcare providers need to encourage adoption of SIDS safe care practices and SIDS safe home environments (Ateah & Hamelin, 2008; Grazel et al., 2010a). They can also support healthy infant environments by encouraging smoking cessation interventions specifically tailored to meet the needs of parents who smoke (Gaffney, 2001).

The American Academy of Pediatrics (2011) argued that a major change in infant safe sleep practice and environment will occur when the wider community encourages parents and caregivers to follow the recent SIDS prevention recommendations. The AAP also found greater improvement occurred when healthcare providers, in particular nurses and midwives, communicated these recommendations (American Academy of Pediatrics, 2008). Neonatal healthcare providers are uniquely placed to provide SIDS prevention advice and education to parents and caregivers. Neonatal healthcare providers can play an active role in teaching on SIDS prevention to assist parents, are critical role models for parents and caregivers and can influence parental decisions about an infant's sleep practice and home environment safety (Bullock , Mickey, Green, & Heine, 2004). Parents who get advice from neonatal healthcare providers on SIDS risks and prevention measures have been found to keep sleep environment safe (Ateah & Hamelin, 2008; McMullen , Lipke , & LeMura 2009). The way neonatal healthcare providers position infants in the healthcare settings strongly influences parental and caregivers practices at home (Gelfer et al., 2013). The first two days of infant's life are a critical time in which neonatal healthcare providers can influence the parents, behaviour and enhance SIDS prevention practices (NICHD, 2013a).

2.3.1 SIDS risk prevention advice relevant and applicable to Jordan

Recent increases in ethnic and social disparity in the incidence of SIDS make it essential that the AAP risk reduction guidelines be explained in a culturally sensitive manner (Van-Nguyen

& Abenhaim, 2013). Jordanian healthcare providers need to educate parents and their families on the risks that most relevant to Jordanian setting and encourage them to follow the evidence- based SIDS reduction recommendations.

Pregnancy Risks Relevant to Jordan

The risks associated with abuse of substances such as alcohol, sedative medications and drugs, are less relevant to the Jordanian setting than in western countries, as the Islamic religion forbids use of these substances; medications are tightly controlled and regulated by government and religion, and recreational drugs are illegal. Substances commonly used in the west therefore remain uncommon in Jordan and it is unusual for pregnant women to use these substances. The Jordanian targeted SIDS prevention recommendations can therefore omit any reference to the abuse of substances other than tobacco. There are still few governmental restrictions or religious objections to tobacco use.

The most significant prenatal SIDS risk factors in Jordan were the high incidence of LBW, preterm and prematurity (Abu-Baker, 2005; Abu-Salah, 2011). In Jordanian public hospitals, the rate of preterm birth is 13%, the prematurity rate is around 11%, and the incidence of LBW infants is around 9% (Abu-Salah, 2011; DOS, 2012; WHO, 2012). These statistics reflect the high tobacco smoking exposure during pregnancy (Abu-Baker, 2005; Khader, Al-Akour, Alzubi, & Lataifeh, 2011). Jordan has the highest smoking rate in the Middle East, with more than 60% of Jordanian adult men smoking (WHO, 2009a). Pregnant wives and their infants are exposed to smoking mainly by their smoker husbands (Abu-Baker, 2005; Azab et al., 2013; Bataineh, Hussein Shawagfeh, et al., 2008; Haddad et al., 2011; Hawamdeh et al., 2003). The incidence of men smoking at home is so high in Jordan that infants and pregnant women are routinely exposed to smoke in their homes (Abu-Baker, 2005; Haddad et al., 2011; Hawamdeh et al., 2003).

It is necessary and desirable to include anti-smoking advice in the Jordanian targeted SIDS prevention recommendations. Several Jordanian studies conducted in the maternal-child health field such as Abu-Baker (2005); Azab, et al. (2013); Bataineh, et al. (2008); Haddad, et al. (2011); Hawamdeh, et al., (2003) have recommended educating parents and families in Jordan regarding the risk smoking poses to the health of infants and pregnant women. Jordanian healthcare providers need to pay particular attention to advising pregnant smokers, pregnant partners of smokers and other family members who smoke. It is especially

important to target families with smokers and young infants less six months of age and so at the highest risk of SIDS.

Jordan's high incidence of women diagnosed with high risk pregnancies and expected to be at risk of having a preterm birth, a premature infant or a LBW infant (Abu-Baker, 2005; Azab et al., 2013; Bataineh, Hussein Shawagfeh, et al., 2008; Haddad et al., 2011; Hawamdeh et al., 2003), means many infants face a heightened risk of SIDS. Researchers therefore encourage healthcare providers to educate families in Jordan about these issues, with Khader, et al., (2011, p. 459) recommending that: "Healthcare professionals should carry out educational programs to increase awareness and understanding of pregnant women and their husbands about the harmful effects of second hand smoke on birth outcomes". Specifically targeted education programs should focus on decreasing high-risk behaviours and encouraging sufficient antenatal care (Van-Nguyen & Abenhaim, 2013).

The key relevant recommendation regarding pregnancy care relate to having regular pregnancy care, having a balanced healthy diet during pregnancy and avoiding short inter-pregnancy intervals of less than one year (American Academy of Pediatrics, 2011a; Hesselink, Van Poppel, Van Eijsden, Twisk, & Van der Wal, 2012; Ugboma & Onyearugha, 2013). While as discussed in the introduction, Jordanian women often have short inter-pregnancy intervals (Khalaf, Abu-Moghli, Callister, & Rasheed, 2008), maternal care has improved in Jordan in recent years. Many of Jordan's pregnant women still do not access regular pregnancy care services, and still lack knowledge about pregnancy care (Okour, Alkhateeb, & Amarin, 2012). As discussed in the literature review, families with lower socio-economic status or lower education levels have a higher risk of SIDS. Peasants, Bedouins and refugees living in the remote rural areas and remote deserts of North Jordan have lower socio-economic status and less education than groups living in the city centres and capital of Jordan (DOS, 2013). Lower socioeconomic families and less educated families have many children. Pregnant women from these groups often have unbalanced nutrition; have insufficient pregnancy care, inter-pregnancy intervals shorter than one year and may have married and become pregnant while still in their teenage years (Altal & Bataineh, 2006; DOS, 2013; Ziadeh, 2001). It is therefore important that targeted tailored SIDS prevention recommendations for Jordanian pregnant mothers include having regular pregnancy care,

having balanced healthy diets during pregnancy and leaving more than one year between pregnancies.

Infancy Risks Relevant to Jordan

As discussed in the introduction, some of the infancy risk factors that appear to be common among Jordanian families are associated with infant sleep care practices, such as infants positioning, bedding, clothing and swaddling. It is necessary and desirable to include positioning bedding, clothing and swaddling advice in the Jordanian targeted tailored SIDS prevention recommendations. Parents and caregivers of infants (0- 6months) need extra attention from education programs as SIDS risk increases during the first six months of infants' life.

Positioning

Jordanians put their infants on their sides after feeding whether they are sleeping or not, which their traditions and beliefs associate with reduce the chance of suffocation of vomiting. Jordanians use both side and supine positions for sleeping infants, but like others from Arabic backgrounds are reluctant to place infant to sleep in the prone position, which their traditions and beliefs associate with an increased risk of sudden death (Inbar et al., 2005). Therefore, it is important for Jordanian healthcare providers to encourage families using only supine sleep positions for sleeping infants and not to place their sleeping infants on their sides for periods longer than the few minutes traditional after feeding to reduce the risk of suffocation and only under supervision.

Jordanians swap their infants between side and supine positions during the first few months of age to reduce the chance of flat head. While there is no statistical data regarding the incidence of flat head among the Jordanian infants, flat head does appear to be a common problem in Jordan. Jordanian healthcare providers need to provide guidance for the prevention, diagnosis, and management of positional skull deformity (Occipital flattening or flat head). They need to educate parents on methods of proactively decreasing the likelihood of the development flat head and need to assist them to initiate an appropriate management method for this deformity (Laughlin et al., 2011). To reduce the chance of flat head, parents can use stomach positions for their infants to play during day time, and they can use side positions while their infants wakeup. Jordanian healthcare providers need to notify parents that using these positions always need an adult supervision.

Bedding

As discussed in the introduction chapter, Jordanians parents add soft objects to the infant's bed such as staffed animals, pillows, quilts, blankets, sheepskins and fleeced, wedges, and bumper pads which increase the risk of SIDS It also common practices in Jordan to cover the infant face by 'Namelieh sheet' that also known as another risk factor for SIDS. Therefore, it is recommended that healthcare providers need to discuss with parents and caregivers these risks associated with bedding and ensure they use a SIDS- safe bleeding practices. Furthermore, Jordanian healthcare providers need to alert parents and their families regarding the unsafety of using quilt rolls, wedges and pillows in infant bed to fix the infant on a side position, which is common bedding practice in Jordan. This can increase the risk of SIDS, as it increases the chance for infant to roll into a prone position, and with presenting of these objects in the sleeping surface, this can cause loose bedding and increase the chance of damping infants face and lead to suffocation and cause sudden death.

Swaddling and Clothing

As discussed in chapter one, Jordanians use extra clothing in winters. Healthcare providers need to advise parents about the risks of this practice and encourage them to use only natural fabric, like cotton for infant clothing, and not to use hats while infant sleeping to reduce the risk of sudden death. As swaddling is a common practice among Jordanian families, it is very important to include safe-swaddling advice in the Jordanian targeted SIDS prevention recommendations. It is also common practice among Jordanian healthcare providers. Healthcare providers need to model the right swaddling practices to families. "Swaddling promotes a more quiet sleep in infants" (Meyer & Erler, 2011, p. 155). They also need to demonstrate and educate parents and families about the risks associated with unsafe swaddling. They also can introduce the Alghmatte as possible strategy to reduce SIDS, which similar to infant sleep sack. But, it is necessary for healthcare providers to assist parents using Alghmatte for the right practice.

Home Environment

Jordanian healthcare providers need to advise parents and families in Jordan about specific risks associated with winters, including heating burns toxins, smoking and mould. As discussed in the introduction, household heating is a main area needed to be considered for SIDS prevention in Jordan. It is need to advise parents and their families about risks

associated with using basic heating resources, such as wood, gas and kerosene, without ventilating the homes. It is important for parents and their families to be aware about the environmental home risks and maintain a high indoor air quality. In particular, more attention need to be provided in educate families from low socio-economical, as these groups mainly have more risks due to use the unsafe heating practices and their homes appear to have more risks. Comparing to high-socioeconomic families, families from low socio-economical, are less enable to provide a quality of infant care practice, and commonly use SIDS-unsafe bedding and clothing due to their lower socio-economic situation.

Breastfeeding

It is also important to encourage Jordanian women to rely more on breastfeeding, which is a positive practice in terms of reducing SIDS and other health risks. However, literature discussed in this chapter shows that breastfeeding women often share their sleep surface with their infants, as it makes breastfeeding more convenient. It is important for Jordanian healthcare providers to pay high attention to alert breastfeed women to avoid share the sleep surface with their infants to reduce the risk of SIDS. Moreover, Jordanian healthcare providers need to pay more attention in educating women who are working, as these identified that they not often provide a complete breastfeeding and they usually wean their infant earlier than non-worker women (Abuidhail, Al-Modallal, Yousif, & Almresi, 2013; DOS, 2013).

As discussed in Chapter One and supported by the literature discussed in this Chapter, the recommendations most relevant to Jordan focus on ‘SIDS-safe sleep practices’, ‘SIDS-safe Alghmatte’, ‘SIDS-safe environment’ and other maternal-infant care practices to reduce the risks of SIDS. The following Table 2.1 summarised in the SIDS prevention recommendations most applicable and relevant to Jordanian setting, and these will used in this study.

Table 2-1: SIDS prevention advice

- **Provide 'SIDS-safe sleep practices'**

Put infant on its back to sleep. Place infant on a firm sleep surfaces and keep loose beddings out of infant's sleep area. Keep soft objects including: stuffed animals, toys, pillows, wedges bumper pads out of infant's sleep area. Do not use rolls in infant's beddings. Refrain from use of excessive bedding and heavy blankets. Do not share sleep surfaces with the infant. Sleep infant without covering its head or the face. Do not use any of the following as infant cribs or bedding mattresses:

- Sleep bags, sheepskin or sheep fleece underlay
- Moisture-resistant cot mattress protector
- Any under blanket which is not made of pure cotton
- Acrylic blanket, or contains polyester
- Any bedding that is quilted, padded, or filled

- **Have SIDS-safe Alghmatte & swaddling**

Wrap infant without covering its head or face. Use only light cotton cloths under the wrap. Do not use a heavy wrapping or multiple layers of wrapping. Put infant to sleep in a sacks. Sure to put wrapped infant in only supine sleep positions. Do not wrap infants in age more than four months, when infant spouse to turn.

- **Have SIDS-safe home environment**

Avoid letting infant over heat or under heat during sleep. Keep infant's environment free of smoke and mould. Maintain high indoor air quality. Keep infant's environment well ventilated.

- **Keep healthy during pregnancy**

Stop maternal smoking as early as possible when planning for pregnancy. Avoid passive smoking exposure during pregnancy. Have frequent antenatal care. Have a nutritional balanced diet during pregnancy. Have at least a one year interval between pregnancies.

- **Others**

Sustain breastfeeding early after birth. Keep at least one year between each pregnancy. Keep educating families in terms of the risk factors associated with SIDS.

2.4 IMPROVING HEALTHCARE PROVIDERS' ROLE IN FAMILY SIDS-EDUCATION

It is necessary to enhance Jordanian healthcare providers' ability to provide SIDS education to parents, caregivers and their families in Jordan. To enable these healthcare providers to play an active role in educating parents, any SIDS education intervention will need to use effective strategies in educating the healthcare providers to enhance their knowledge and their own practices. (McMullen, Lipke, & LeMura, 2009). Healthcare providers need to be aware

of both the most current SIDS prevention recommendations and background reasoning to provide consistent advice and rationales to parents and caregivers. An awareness of the current evidence is important to ensure that recommendations are correctly provided for reducing the risk of SIDS (Colson & Joslin, 2004; Wilson, Quine, & Lewis, 2010). Neonatal healthcare providers can model SIDS-safe practices effectively to parents when they get education (Grazel et al., 2010a). Studies have concluded that both neonatal healthcare providers should provide more consistent information about infant sleep care practices and environmental factors with regard SIDS risk reduction (Bredemeyer, 2004; Grazel et al., 2010a).

This section identified gaps in SIDS knowledge and family SIDS-education practices among healthcare providers worldwide, in the Middle East region, and in particular in Jordan. The following sections also discuss literature available on SIDS intervention targeted the healthcare providers and identified strategies can used effectively in educating and changing behaviours among healthcare providers and effectively enhance their practices for SIDS education to families in Jordan.

2.4.1 Identifying the gap in SIDS knowledge and family SIDS-education practice among healthcare providers

Studies found that more education for hospital nurses is needed about SIDS prevention measures, as well as the AAP Guidelines (Aris et al., 2006; Bullock et al., 2004; Wilson, 2008). There is scope for neonatal healthcare providers to improve their teaching and modelling the safe infant sleep practices to parents (Healthy Canadians, 2009; McMullen et al., 2009). Many studies from countries around the world suggest that neonatal healthcare providers have insufficient knowledge about SIDS. Developed countries have provided extensive research on SIDS and many education campaigns are available to teach healthcare providers about SIDS prevention recommendations. However, studies conducted in developed countries suggest that neonatal healthcare providers including midwives, nurses, general practitioners and relevant training students have inconsistent knowledge about current SIDS prevention messages and still need further education, and training on SIDS prevention and there still often lacking in this area (Bullock et al., 2004; Grazel et al., 2010b; Lerner, McClain, & Vance, 2002; Wilson et al., 2010). In the US, Aris et al. (2006), conducted a study in New York to assess neonatal healthcare providers' (neonatal nurses) knowledge and

discharge teaching practice related to SIDS prevention measures, including safe sleeping position. She concluded that nurses still have inconsistent knowledge on SIDS and there are almost half of neonatal nurses do not provide SIDS prevention advice to parents:

> ...only 52% of neonatal nurses routinely provide discharge instructions that promote supine sleep positions at home. This study suggests that nursing self-reports of discharge teaching practices are inconsistent and in some cases in direct conflict with the national "Back to Sleep" recommendations, which emphasize that the supine position is the safest position for healthy full-term and preterm infants after hospital discharge (Aris et al., 2006, p. 681).

In Australia, Wilson (2008) conducted a cross-sectional study using qualitative and quantitative approaches in Sydney to evaluate the knowledge on SIDS prevention among a sample of neonatal healthcare providers (General Practitioners (GPs) and nurses). The study found there is still a great need to improve the knowledge of SIDS prevention measures in these groups. The lack of knowledge among neonatal healthcare providers is also a potential contributor to a knowledge deficit among families. There is a need for ongoing SIDS prevention education for health care providers, particularly those who were not educated in an English speaking country. As Wilson (2008) states:

> Of greatest concern is the poor knowledge of safe sleeping and SIDS reduction messages in GPs who were born in a country where English is not the first language. In this study, as in previous research, women from a CALD [Culturally and Linguistically Diverse] background indicated they primarily access GPs who speak their native language, for health care. Where GPs have poor knowledge of safe sleeping . . . (Wilson, 2008, p. 189).

Similar studies from developing countries have the same conclusion. Number of studies conducted in the Middle East (Turkey, Israel, Eremites, and Saudi Arabia) by Inbar et al., (2005); Efe, Sarvan, & Kukulu, (2007); Abdulrazzaq, Kendi, & Nagelkerke, (2008); Nofal, Abdulmohsen, & Khamis, (2011); Yikilkan et al., (2011). These studies shed light on the need to develop a SIDS education program for neonatal healthcare providers and families in the region, as they have shown an insufficient awareness among these groups about SIDS risks and prevention recommendations (Abdulrazzaq et al., 2008b; Efe et al., 2007; Inbar et al., 2005; Nofal et al., 2011b; Yikilkan et al., 2011b).

> Most of the mothers were unaware of SIDS and less than half preferred a supine sleeping position for their infant. Only 72% of health professionals recommended a certain sleeping position during family interviews. Health

> professionals are more often recommending the side sleeping position or prone. Education of families and health professionals for the risk factors of SIDS may reduce the number of deaths from SIDS in Istanbul [Capital city of Turkey] (Yikilkan et al., 2011b, p. 24).

The same conclusion has been made by Bataineh, et al. (2008), who conducted a study investigating mortality causes among infants in north Jordan. However, the literature has emphasized the importance of providing parents and caregivers with appropriate advice about SIDS-prevention recommendations. Jordanian neonatal healthcare providers did not include any SIDS education in the infant care plan. However, evidence suggests that Jordanian neonatal healthcare providers can be encouraged to start educating families regarding SIDS risks, as most of the infant mortality in Jordan is related to preventable and modifiable risk factors (Bataineh, Hussein Shawagfeh, et al., 2008; Khoury & Mas'ad 2002).

Neonatal healthcare providers including nurses, midwives, medical staff, practitioners and training students, can model SIDS-safe practices and effectively educate parents and other child caregivers to adopt those practices (Colson & Joslin, 2004; Grazel et al., 2010a; Lerner et al., 2002; Wilson et al., 2010). Neonatal healthcare providers can strongly influence parents' infant care practices, they need to be aware of the current evidence and public health recommendations for SIDS prevention practices (Bredemeyer, 2004). In the Jordanian healthcare settings, could involve neonatal healthcare providers, including nurses and midwives, as well as medical and nursing students to educate families in Jordan regarding the Jordanian relevant SIDS risks and prevention recommendations. There is, however, not enough known about Jordanian neonatal healthcare providers' awareness of SIDS risks and prevention guidelines; if they access the appropriate recourses for SIDS information, or if they provide any education to parents relevant to SIDS prevention. Research to date suggests that healthcare providers in the Middle East have insufficient knowledge about SIDS prevention recommendations and that they also unaware about the update SIDS prevention recommendations (Abdulrazzaq et al., 2008b), as this they do not play a role in the educating families. Neonatal healthcare providers need to enhance their knowledge and their own practices of SIDS prevention (McMullen et al., 2009).So, it is important requirement to keep educating neonatal healthcare providers including medical practitioners, nurses, midwives, and relevant training students about SIDS (Abdulrazzaq et al., 2008b; Aris et al., 2006; Lerner et al., 2002; NICHD, 2013a; Wilson, 2008; Yikilkan et al., 2011b).

Neonatal healthcare providers have been shown to be the most significant influence in changing health practices including the introduction of SIDS prevention initiatives (NICHD, 2013a). It is clear from literature reviewed that neonatal healthcare providers in a place that enable them to play a vital role in reducing the risk of SIDS by educating families regarding SIDS, leading to change the risky practices.

2.4.2 Intervention targeted neonatal healthcare providers' to enhance family SIDS-education practices

The National Institute of Child Health and Human Development (NICHD), offers a Continuing Education Program on SIDS Risk Reduction for nurses on SIDS risk reduction. In addition to supporting health care providers, this program keeps health care providers up-to-date with new data and recommendations on SIDS prevention. The Continuing Education Program on SIDS Risk Reduction has suggested that by increasing knowledge on SIDS risk prevention measures among nurses, and, through these educated healthcare providers, educating parents and caregivers, unsafe care practices could be changed in just a few minutes (NICHD, 2013a). The adaptation of these programs in different places in the world will yield incredible benefits for an infant's health and enhance their survival rates.

> The Continuing Education Program on SIDS Risk Reduction: Curriculum for Nurses is designed to inform all nurses - paediatric, obstetric and neonatal nurses and those who educate family members and caregivers about caring for infants - about the latest strategies for reducing the risk for SIDS (NICHD, 2013a, p. 2)

Lerner, et al (2002) suggested that there is a need for teaching resources targeting healthcare providers. Providing an integrated set of educational materials and activities such as online sessions, online materials, audio-visuals materials, workshops and printing education materials appear suitable and effective to use in the healthcare place for healthcare providers(Lerner et al., 2002, p. 353). Therefore, as part of the targeted tailored Jordanian SIDS educational package, SIDS health professional educational materials needed to be developed. Furthermore, using multiple interventions for SIDS education such as sessions, meetings, phone counselling, pamphlets, posters, and images appears effective and worthwhile. A study conducted by Gelfer, et al. (2013), providing educational programs for nurses in NICU, found that after providing SIDS-education for the healthcare providers, the SIDS-safe infant sleeping practices were improved among the healthcare providers and also

positively impacted on parents' behaviour and practices in their homes: "Multi-factorial interventions improved compliance with safe sleep practices in the NICU and at home" (Gelfer et al., 2013, p. 1264). In Jordan, it would be helpful to provide SIDS education via multi-educational intervention strategies, including posters, pamphlet, sessions and videos. In Jordan, there are regular teaching sessions provided for healthcare professionals on relevant health topics. Workshop sessions and meeting speakers are widely used as effective education strategy to educate healthcare providers and change their practices in the healthcare settings (Ministry of Health-Jordan, 2013). In addition, providing kind of written education materials such as pamphlets and using posters recognised as desirable way among healthcare providers. Using these multi-educational intervention strategies lead to quality improvement (Gelfer, et al., 2013).

Educating healthcare providers about SIDS has been shown to be an effective strategy to enhance their knowledge and practice. A study conducted in USA by Mcmullen, Lipke, and Lemura, (2009) aimed to increase the NICU nurses' knowledge of SIDS, by providing an education prevention program, including a computerised teaching tool. This study demonstrated the need and the value of educating neonatal nurses about SIDS. It also showed that providing the appropriate sleeping sacks (safe-swaddling cribs) in the NICUs resulted in increase the number of infants with SIDS-safe sleeping conditions and the study concluded that: "This model program can easily be replicated to enhance neonatal nurses' knowledge about SIDS prevention" ((McMullen et al., 2009, p. 7). In Jordan, it is suitable to target the neonatal nurses and educate them about SIDS. In addition, for this stage and with the budget of current study, it is more cost effective and culturally sensitive to teach the nurses in Jordan to adapt the traditional practice of Alghmatte to provide SIDS-safe swaddling. By acting as role models and using easy to understand education materials, such as images, poster, and nurses can educate families about SIDS-safe infant care practices, the SIDS education will improve in Jordan like other places in the world.

Interventions for improving both knowledge and behaviour of healthcare providers have shown effective change, especially for consideration about the most SIDS-safe infant sleep position "Primary care providers should be encouraged to develop quality improvement initiatives to improve adherence with safe sleep recommendations among their patients" (American Academy of Pediatrics, 2011b, p. 1358). Therefore, change would need to

enhance healthcare providers' knowledge as well as their attitude for SIDS prevention recommendation at the same time:

> . . . . merely providing information to increase knowledge alone is not enough to change behaviour, as attitude was an important factor for the behaviour. Theory-based intervention associated with change in behaviour will have an impact on parents' attitudes (Chung-Park, 2012, p. 235).

A number of studies have used strategies to enhance knowledge as well as attitudes and behaviours of the healthcare providers regarding family SIDS education, including involving a group of trainers to enable them to play an active role in training other individuals and educating the targeted groups. Train-the-trainer models have been found effective in number of research aiming to change practices and behaviours. It also found effective to enhance knowledge regarding the SIDS safe practice among childcare providers (Moon & Oden, 2003). A study conducted by Moon, Calabrese, and Aird (2008) to evaluate the effectiveness of using AAP curriculum SIDS-prevention recommendations in educational sessions *(AAP Reducing the Risk of SIDS in Child Care Speaker's Kit)* and the effectiveness of using train-the-trainer model in changing child care providers' behaviours regarding SIDS-safe sleep practices. A random sample of participants from different child care centres and family child care homes were assigned for intervention and control groups. In the initial stage infant sleeping positions were observed. It also performed assessment of inventory sleep policies and administered knowledge and practices questionnaire to the participants. Trainers then used the AAP curriculum in educational sessions for the staff. After three months, a follow-up observation have been conducted by an observer volunteers to observe infant sleeping positions after the education interventions. Childcare providers completed the second questionnaire to evaluate the changes in knowledge, practices and evaluate the barriers involving the implementation of the SIDS-safe sleep practices. A total of 1212 child care providers completed the study and the care of 1993 infants was observed. The study found that a SIDS risk reduction curriculum using a train-the-trainer model is effective in improving the knowledge and practices of childcare providers. The childcare providers' awareness of the AAP SIDS prevention recommendations were increased after the interventions, also the practices of safe-sleep position have also improved, after the intervention. Moon, Calabrese, and Aird (2008) concluded some barriers for ongoing work and the importance of continuing educating parents about the SIDS prevention recommendations:

> Perceived parental objections, provider skepticism about the benefits of supine positioning, and lack of program policies and training opportunities are important barriers to implementation of safe sleep policies. Continued education of parents, expanded training efforts, and statewide regulations, mandates, and monitoring are critical to ongoing efforts to decrease further the risk of sudden infant death syndrome in child care (Moon et al., 2008).

2.4.3 Methods used in SIDS research

Most SIDS intervention research depends on self-report to reflect the knowledge and behaviour change among healthcare providers. This may not reflect behaviour and practices accurately in this regard. Observation of clinician behaviour can strengthen the intervention, such as observing the changes in the infant positioning practices in the healthcare setting and observing the changes in the family SIDS education practices on hospital's discharge teaching plan. Although there is an available body of literature on observation in healthcare settings, there have been few studies that used direct observation in healthcare settings to assess health and safety performance after an educational intervention and few studies used combined self-knowledge and practice reports with independent observations such as studies conducted by Airs et al., (2013); Moon, et al., (2008); and Mcmullen, Lipke, & Lemura, (2009) where healthcare providers' knowledge and educating practices regarding SIDS were surveyed as well as observed the infant care practice. A Jordanian targeted SIDS education package needs to include both self-reports and observations to reflect both knowledge and behaviour regarding SIDS-safe care practices and family SIDS-education practices.

A study conducted by Moon, Oden and Grady (2004) found a 15-minute small group educational intervention was effective in changing sleep position practices and behaviour among black parents in US. This study recommended that the effect of the intervention is sustained throughout the first six months of life, when the infant is at the highest risk for SIDS. A comprehensive Jordanian SIDS risk reduction strategy would need to address the education needs of healthcare providers and of families. Thus, 15-minute sessions and small groups appear highly effective in educating parents and caregivers. In healthcare settings, staff are usually busy and have short windows of time to meet with parents due to time limitations and hospitalisation policy. Therefore, it is much more feasible to provide a 15-munite education intervention to parents and caregivers in such a setting. In addition, having small group of parents and caregivers will encourage communication between staff and parents and enable them to get the messages effectively. This strategy (15-minute of direct

education and small group education sessions) appears to be a useful approach for this intervention and can work with both Jordanian healthcare providers and parents.

In Jordan, other public health interventions have used posters and pamphlets to educate staff and the public and have been a widely effective strategy used by the Jordanian Ministry of Health to educate parents about different maternal-child health education topics (Ministry of Health-Jordan, 2013). One of the most effective prevention campaigns was the country project of family planning and child immunisations. The Ministry of Health used posters, pamphlets and audio-visual materials (videos) in Jordanian healthcare settings, as well as used TV media. Therefore, a key strategy to use for SIDS prevention education is using a range of posters and pamphlets, which proved effective in enhancing knowledge regarding SIDS risks and prevention recommendations. As well, using this strategy for a SIDS education appears very significant for changing the healthcare providers' behaviours and changes the risky practices among families in Jordan.

2.4.4 SIDS intervention campaigns in western countries

Many SIDS education campaigns are available in western countries, which provide the education for healthcare providers as well as other community members. These campaigns have been effective in terms of enhancement the community awareness about SIDS and prevention practices (APA, 2011a; NICHD, 2013a). SIDS risk prevention remains an important public health priority (CDC, 2014). Mass media campaigns can enhance health-related behaviours across the country (Wakefield, Loken, & Hornik, 2010). SIDS-intervention campaigns had been effective, especially ones implemented in a number of developed countries like US, UK, Australia, and Canada. Since the release of the APA task force on SIDS prevention recommendations SIDS has decreased by 50% in the US (NICHD, 2013a). SIDS prevention campaigns improved SIDS-safe sleep practice among parents and care givers and health care providers (NICHD, 2010). "Reports from the Netherlands, Great Britain, Australia, and New Zealand indicate that avoiding the prone position for infants in the first 6 months of life could reduce the number of SIDS deaths by as much as 50%." (Guntheroth & Spiers, 1992, p. 2359). 'Back to Sleep' or BTS program started in 1994, aimed to educate parents and caregivers as well as healthcare providers regarding SIDS-safe position to enhance the SIDS-safe positioning practices. This program has successfully decrease SIDS rates. Since the program started the SIDS rate has fallen by more than half in

USA in 2006 (CDC, 2010; Trachtenberg et al., 2012a). Similar, BTS campaigns run in a number of developed countries, such as Australia, New Zealand, UK, Germany, Sweden, France and Canada showed significant impact on SIDS statistics and improved SIDS-safe sleep practice among parents, care givers and health care providers (Darrah & Bartlett, 2013; Mitchell & Blair, 2012; Moon & Omron, 2002; Trachtenberg et al., 2012b). *SIDS and Kids* is one of the most effective SIDS public awareness campaigns and is used in Australia (SIDS and Kids, 2013b). The mission of this campaign is to enhance the survival of the infant's life through education and research. This campaign provides a variety of educational resources including online and printed materials. It is targeted at parents, caregivers and health care providers. Furthermore, it provides training courses on SIDS prevention strategies for health professionals and community volunteers. Since it started the community awareness of SIDS risk and prevention has increased (SIDS and Kids, 2013a).

2.5 THEORETICAL AND CONCEPTUAL FRAMEWORK GUIDING THIS DISSERTATION

As noted in chapter one and supported by this chapter, the most fundamental changes needed in Jordan relative to SIDS education are infant sleep care practices and the education on risks in the home environment. Reducing the incidence of SIDS in Jordan requires behavioural changes by three key groups: 1) Parents and caregivers e.g. older sisters, grandmothers and other female relatives, few of whom will have an understanding of SIDS or its incidence in Jordan. 2) Healthcare providers and educators, who may likewise be unfamiliar with concept of SIDS, the statistics SIDS in Jordan or with the key measures to decrease the incidence of SIDS. 3) The Jordanian government and other organisations involved in infant care, involving on decision making on health policy and gathering and providing statistics on infant mortality.

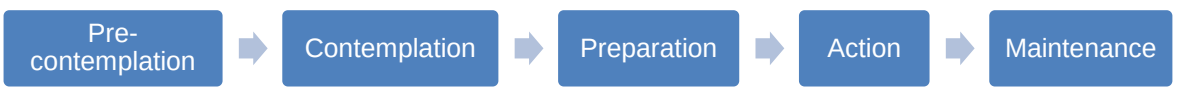
Enhancing the knowledge, skills and resources of healthcare providers regarding SIDS prevention recommendations could better equip them to change the infant care practices of families and dramatically reduce infant mortality in Jordan. The key points to enhance healthcare provider role in SIDS prevention process is by enhancing their knowledge and perception about SIDS risk factors and prevention practices. In addition to encouraging them to deliver the SIDS prevention advice to parents, their families, and other child caregivers, an

intervention should also encourage clinicians to share the SIDS prevention knowledge with other healthcare providers in Jordan.

2.6 CONCEPUTAL FRAMEWORK: BEHAVIOUR CHANGE THEORY

Neonatal healthcare providers can play various important roles as educators, advisors, as well as modelling the maternal-infant health care practice. As discussed in the literature review to achieve the required behaviour change among families will need to change behaviour of neonatal health care providers to play active role in educating families in Jordan regarding the SIDS risks and prevention practices. To change neonatal healthcare providers' behaviour, it is important to improve their knowledge about the current problem and use method that encourage them to think about the problem and suggest solutions.

Behaviour change theory (BCT) was used as the conceptual framework for the development and implementation of the targeted and tailored SIDS education program developed for this project. As it was a first time to present the SIDS education in Jordan, and this area is affected by individuals' knowledge and behaviour about the SIDS-safe practices among neonatal healthcare providers. It also affected by level of awareness among families in Jordan. BCT suitable to adapt as it consists of multiple stages to change old undesired human behaviour and maintain a new healthy behaviour. BCT can use to obtain a conceptual model of environmental and individual change that guided the SIDS educational intervention, the data collection instruments, and the methods used for data collection in this dissertation. According to Prochaska and Velicer (1997), there are five critical stages for BCT, these include pre-contemplation, contemplation, preparation, action, and maintenance (See Figure 2.1).



2-1: Changing behaviour theory

In the first stage (pre-contemplation), there is no consideration of change and the individual does not realise that there is a problem associated with their current behaviour. In the second

stage (contemplation), the individual starts thinking about the problem and begins identifying the problem in their experience. In the third stage (preparation), the individual starts making plans to change their old behaviour. In the fourth stage (action), the individual is starts the process of changing and implementing the change. Finally, in the fifth stage (maintenance), the individual sustains the achieved changes. The benefit of using the BCT model of behaviour change is that it uses multiple stages to achieve the desired change and it includes a maintenance stage working to prevent relapse.

In applying the BCT framework to the current research question and issues for this dissertation, there are a number of parallels between the institution and the clinicians working in the institution. In the pre-contemplation stage, it was important to recognize that, at baseline, there was no consideration of changing SIDS education practices since there were no formal practices being engaged in. Baseline data was collected to determine whether Jordanian neonatal healthcare providers knew about the international guidelines for SIDS prevention practices, if they advised families about these recommendations, and if they currently practiced SIDS-safe practices in the hospital. In the contemplation and preparation stages, which are designed to encourage the individual to start thinking about the problem and how this could impact on the child health care services; the research team engaged key stakeholders and hospital administration staff in education and discussion sessions as groundwork for the intervention project. In this phase, healthcare providers started to make suggestions for the implementation plan and suggestions as to ways to change the old behaviour and start providing the SIDS education to families. The action phase involved the development and implementation of the JSEP intervention. As part of the action/change phase, post-implementation data collection was conducted to determine if the intervention impacted the knowledge, SIDS safe advice activities, and access to SIDS resources in the intervention group. In the maintenance phase, recommendations for expanding and improving the intervention are now being contemplated by KAUH.

2.7 STUDY SIGNIFICANCE

The literature has emphasised the importance of providing Jordanian parents, child caregivers and other family members with appropriate advice about SIDS-safe sleep practices and SIDS-safe environments. Since little was known in Jordan and the Middle East about

healthcare providers' knowledge and practices for both SIDS safe sleep practices and SIDS-safe environment, or whether they play role in educating Jordanian parents, child caregivers and other family members regarding SIDS risks and relevant prevention recommendations. As a baseline assessment data is required of Jordanian health care providers' knowledge and practices regarding SIDS prevention recommendations. This study sought to explore knowledge and educating practices regarding SIDS risks and prevention recommendations among a sample of Jordanian health care providers (nurses and midwives) in a major healthcare setting in Jordan.

This project is significant because as far as was the first to introduce SIDS prevention education program into a Middle Eastern country, using Jordan as a case study. It is anticipated that this project demonstrate an enhancement in the knowledge and practices of healthcare providers on SIDS prevention. As well, it is anticipated that the education program introduced in this project will enhance the teaching practices regarding SIDS to Jordanian parents, child caregivers and other family members. This can encourage Jordanian parents, child caregivers and other family members to follow the SIDS prevention recommendations at home and on childcare settings, which will impact on SIDS incidence in future.

2.8 RESEARCH QUESTIONS

This mixed method intervention study included both quantitative and qualitative data collection and was conducted in three data collection phases. Phase one assessed the neonatal SIDS-safe infant positioning practices as well as investigating SIDS knowledge and family SIDS education practices among neonatal healthcare providers in a one major hospital setting in Jordan prior to implementing a targeted tailored Jordanian SIDS education package (JSEP). In phase two, the JSEP was implemented and evaluated for its effectiveness and feasibility. Phase three involved a qualitative set of discussions with intervention participants to discover what their experience was and to ask for suggestions on how to improve the education program for other clinicians like themselves as well as suggestions for future directions to reduce SIDS risks and SIDS incidence in Jordan. The main research questions for this project are:

1. Do neonatal healthcare providers practise SIDS-safe positioning for infants sleeping in cots in the hospital setting?

2. What knowledge, perception, and beliefs do neonatal healthcare providers have regarding SIDS-safe positioning practices?

3. Are the hospital's neonatal healthcare providers aware of the current SIDS risks and prevention guidelines or resources to obtain SIDS risks and prevention practices information?

4. Do the hospital's neonatal healthcare providers provide families with any education relevant to this topic?

5. Does the JSEP improve the SIDS-safe infant positioning practices by neonatal healthcare providers in the hospital setting?

6. Does the JSEP improve the SIDS knowledge, and ability to access appropriate SIDS resources among a convenience sample of neonatal healthcare providers in Jordan?

7. Does the JSEP improve the practical ability to educate families regarding SIDS risks and prevention practices, among convenience sample of neonatal healthcare providers in Jordan?

8. What are the challenges and future directions for SIDS prevention in Jordan?

2.9 SUMMARY

This chapter discussed the literature regarding SIDS and SIDS prevention. Research showed that a targeted in-workplace educational program was effective in increasing healthcare providers' awareness and knowledge regarding SIDS risks and relevant prevention practices. It also changed behaviour regarding the risk practices, and increased the use of SID-safe sleep position practices and strengthened SIDS related policies in the healthcare and childcare settings, as well as promoting the development of family SIDS education practices. The literature presented in this chapter indicated the significance of implementing a SIDS education package targeting Jordanian healthcare providers. This chapter also provided baseline evidence to support development of an appropriate SIDS education package for use in Jordan. The newly developed targeted tailored Jordanian SIDS education package (JSEP) needs to suit the Jordanian setting, be cost effective, have a direct impact on neonatal healthcare providers' knowledge and practices, and enhance their ability to provide SIDS education to families. The next chapter presents both the methods used in this research and the methods used to develop and implement the JSEP.

Chapter Three - Methods

The review of the literature indicated that western countries are aware of SIDS-risk factors, and many have implemented prevention campaigns and improved infant care practices to reduce the risk of SIDS. In contrast, there is little investigation for SIDS and SIDS-prevention strategies among developing countries. American Academy of Pediatrics (2011b), American SIDS institute (2011), SIDS and Kids Australia (2011) and NICHD (2013a) recommended that neonatal healthcare providers use SIDS prevention recommendations to advise families in increasing their awareness of the risk factors and to change their risky practices. The way in which parents manage their infants sleeping care practices is highly influenced by neonatal healthcare providers' advice (New Zealand Ministry of Health, 2008; NICHD, 2013a). It is important to enhance neonatal healthcare providers' ability to provide SIDS education to families by providing them with the required education and training (McMullen et al., 2009). Prior to this study, there was no known evidence of SIDS education in Jordan, and Jordanian parents and child caregivers appeared to be unaware of the risks of SIDS and SIDS-prevention measures.

The review of the literature provided baseline information about SIDS, appropriate SIDS education materials and effective education strategies to use in Jordan. This study aimed to educate neonatal healthcare providers in Jordan about SIDS risks and prevention practices, and improve their ability to provide SIDS-education to parents and families as well as enhance SIDS-safe positioning practices in the neonatal units at hospital settings. This was significant because the introduction of SIDS education has the potential to positively impact infant care practices among families in Jordan and lower SIDS risks.

This hospital-based interventional study conducted at King Abdullah University Hospital (KAUH), the major university hospital in Jordan, targeted neonatal healthcare providers. A mixed method utilising both qualitative and quantitative data collection methods investigated the impact of a targeted and tailored SIDS Education Prevention Package (JSEP) in Jordan. Data collection methods included questionnaire-surveys, visual-observations surveys, field notes, feedback and focus groups. This study used three main quantitative and qualitative stages of data collection to answer the main research questions over three phases, as tabled below.

Table 3-1: Research questions

	Research questions
Phase-1 Baseline data collection	- Do neonatal healthcare providers practice SIDS-safe positioning for infants sleeping in cots in the hospital setting? - What knowledge, perception, and beliefs do neonatal healthcare providers have regarding SIDS-safe positioning practices? - Are the hospital's neonatal healthcare providers aware of the current SIDS risks and prevention guidelines or resources to obtain SIDS risks and prevention practices information? - Do the hospital's neonatal healthcare providers provide families with any education relevant to this topic?
Phase-2 Post-intervention data collection	- Does the JSEP improve the SIDS-safe infant positioning practices by neonatal healthcare providers in the hospital setting? - Does the JSEP improve the SIDS knowledge, and ability to access appropriate SIDS resources among a convenience sample of neonatal healthcare providers in Jordan? - Does the JSEP improve the practical ability to educate families regarding SIDS risks and prevention practices, among convenience sample of neonatal healthcare providers in Jordan?
Phase-3 Post-intervention Focus groups	- What are the challenges and future directions for SIDS prevention in Jordan?

Phase-one involved two main surveys for data collection. The first survey was a cross-sectional observation of infant positioning practices for healthy and medically stable preterm/full-term infants sleeping in open cots in the neonatal units at KAUH. The second was a cross-sectional, standardized questionnaire that investigated neonatal healthcare providers' SIDS knowledge, availability of SIDS resources used to access the information, and their SIDS education practices for families in Jordan prior to development and implementation of hospital-based SIDS intervention program targeting the neonatal healthcare providers.

The findings from Phase one were used to inform Phase two data collection activities, development and implementation a tailored SIDS education package for the healthcare providers in Jordan, and analysis of the data. Field notes and feedback were used in the JSEP development and implementation stage. Phase-two involved two main surveys for data collection. The first survey was a cross-sectional observation of infant positioning practices for healthy and medically stable preterm/full-term infants sleeping in open cots in the neonatal units at KAUH following the intervention. The second survey was a post-intervention application of the same standardized questionnaire investigating neonatal healthcare providers' SIDS knowledge, availability of SIDS resources they used to access the

information, and their SIDS education practices for families in Jordan, following their exposing to the hospital-based SIDS intervention program.

Phase-three involved post-intervention focus groups with a purposeful sample of neonatal healthcare providers exposed to the intervention program. These focus groups discussed their experience of the intervention program; it also shed light on challenges for SIDS prevention, and obtained recommendations for improvements of the intervention for future application.

This chapter discusses the research methodologies used in the study. The following section describes the study setting, design, participants and targeted population, instruments, ethical consideration, data collection and data analysis methods, as well as, the intervention used and procedures.

3.1 STUDY SETTING

The researcher selected KAUH (figure 3.1) for piloting the JSEP. KAUH is regarded as a particularly appropriate setting for the study because this public hospital is a leading educational hospital in North Jordan:

- Offers easy access to a critical mass of healthcare providers, trainers and educators and observable population of infants.
- Has ongoing contact with families of young children via maternal-child clinics and child birth, neonatal and paediatrics services.
- Provides number of education programs for healthcare providers and families.
- Has experience and familiarity with continuous education programs.
- Has familiarity and expertise with research projects.
- Trains students in health sciences who have rotations to many of the more 150 MCH centres in the surrounding community.
- Has access to resources such as internet access, library, computing, printing and editing, relevant to education programs.

3-1**: Picture of KAUH, Jordan**

The setting for this study was KAUH, regarded as one of the most distinguished hospitals in Jordan, the Arab world and Middle East region (Jordan Medical Directory Website, 2012). The education and professional systems at KAUH are far better developed than at other hospitals in northern Jordan. The mission statement of KAUH is to provide quality care and keep up to date with new knowledge in order to improve services and working systems. KAUH has received numerous international and local awards (Altal, 2013). KAUH has a well-established quality management system, certified as meeting the International Standard Organisation's "ISO 9001" quality management certification in 2011 and 2012. ISO accreditation is proof of a high level of professionalism at both KAUH and JUST (Alrai Newspaper, 2013) and helps ensure the needs of staff, customers and stakeholders are met.

The hospital has a 683-bed capacity (KAUH Website, 2011). There are eight wards providing maternity and child healthcare services for a monthly average birth rate of 340. The hospital also encompasses outpatient medical clinics, including maternity and childcare clinics. Approximately 150 neonatal healthcare providers (nurses and midwives) are employed in the maternal-child healthcare units and approximately 200 neonatal healthcare trainers from different academic institutions are trained in these units each academic semester.

KAUH trains more than two thousand medical and health trainees from different universities each year. To facilitate clinical training, students are trained in groups with many rotations; for example, nursing and midwifery students enrolled in a clinical health unit. Each group trains two days a week in the hospital and they also have a rotation training between maternal and child health clinics (MCHCs) and the hospital. KAUH is uniquely designed to facilitate

teaching, and has several teaching rooms and three large halls. Each ward has a conference and meeting room for meetings, conferences and teaching purposes (KAUH Website, 2011). KAUH has a Continuous Education Program (CEP), the role of which is to provide ongoing education to hospital healthcare providers, organise workshops and provide educational resources. The CEP also delivers major education workshops to staff and orientation and induction programs to newly graduated nurses and midwives. The CEP website provides up-to-date information about research on nursing care practices.

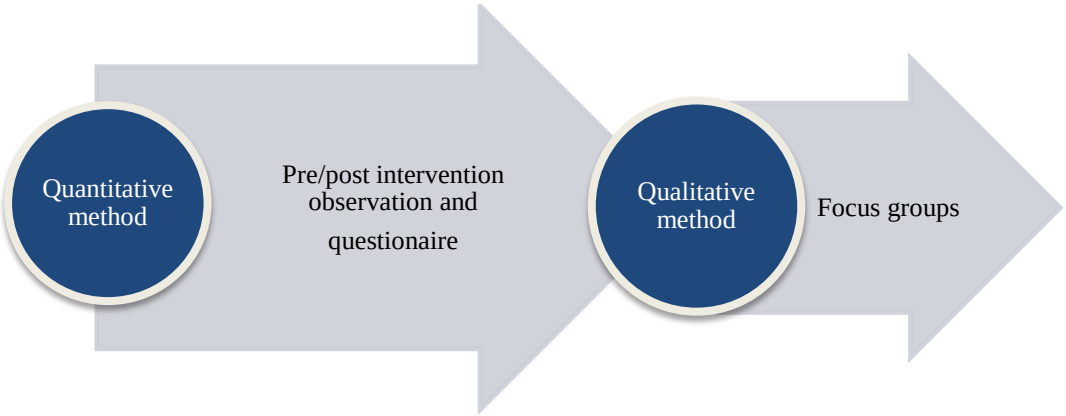
The hospital is located within the precinct of the medical colleges of the Jordan University of Science and Technology (JUST), which has had an affiliated teaching program with KAUH for over ten years (JUST Website, 2011). JUST is one of Jordan's ten universities. Its education system has been adapted from the American education system and frequently uses American resources. JUST has partnerships with universities in the United States of America USA and UK (The Jordanian Education System, 2011). Having graduated from JUST and trained, worked and instructed at KAUH for approximately eight years, this researcher was familiar with KAUH network and operations.

KAUH conducts a number of research projects in health and administration each year, and has an independent research ethics committee called "The Institutional Review Board" or IRB. It facilitates human subject research, ensures the rights and welfare of human participants are protected and also evaluates risk-benefits (The Office of Human Research Protection, 2012). All human research conducted at KAUH must be approved by the IRB committee. Thus, KAUH is an appropriate setting to conduct this innovative exploratory research project.

3.2 STUDY DESIGN

Mixed method design (Creswell & Plano Clark, 2007) provides an appropriate structure for this study (See Figure 5.1). As discussed in the literature review, the majority of SIDS intervention studies have only used quantitative data collection methods. In addition, as far as can be ascertained, no previous SIDS education package had ever been implemented in a hospital setting in Jordan. This study was the first of its kind in the country and in the Middle East region. Having a mixed method design of both qualitative and quantitative data provided depth and sufficient information to meet the study goals. Mixed method explanatory

sequential design is usually conducted in two stages, starting with a quantitative data collection and analysis followed by the subsequent qualitative data collection and analysis to get a better understanding of the study problem (Creswell & Plano Clark, 2007). Quantitative methods provide inferential and empirical measured data, while qualitative methods were used to best describe participants' experiences and perceptions of the change (Silverman, 2005). Focus groups ideally consist of between six and 12 participants for effective communication (Bresciani, Zelna, & Anderson, 2004), and these small focus groups can provide valid qualitative data, while large samples are needed to provide valid quantitative data.



3-2: Mixed method study design

In this study, a Participatory Action Research (PAR) approach (Fals-Borda, 2001) was adopted to develop and implement the JSEP. The PAR approach provided the flexibility to adapt and develop a relevant and effective SIDS education package to the Jordanian settings and put it into operation in a dynamic way. Support for the program from the hospital stakeholders, and healthcare providers increased the likelihood of its acceptance and ongoing use. The PAR approach not only allowed the researcher to meet the goals of the study, but also to involve the neonatal healthcare providers and stakeholders in planning and implementing the changes within their workplace by means of a democratic process.

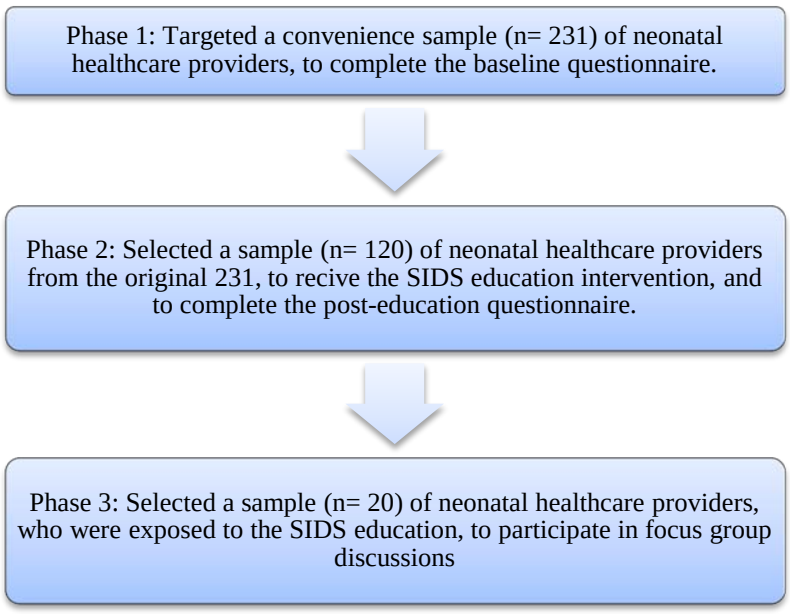
3.3 STUDY PARTICIPANTS AND DATA COLLECTION STEPS

The accumulated evidence suggests that neonatal healthcare providers including nurses, midwives, medical staff, practitioners and training students, have an important role to play in

educating families about SIDS risks and prevention practices (NICHD, 2010; AAP, 2011; Wilson, 2008). Therefore, it is important for the Jordanian SIDS education package to involve neonatal healthcare providers, as they have regular contact with parents, their families and other child caregivers, that create opportunity to provide the SIDS education. This clinical study needs to include the vital groups of neonatal healthcare providers and educators in units having direct contact with families. Although the ultimate goal of this study was to target all the clinical personnel in NICUs and nurseries as well as other maternal-chid healthcare units (labour units, antenatal units, postnatal units, maternity clinics and paediatrics clinics), due to the time constraints of the study, and based on the literature reviewed, this project used a "train-the-trainers" model of educating a convenience sample of neonatal healthcare providers with the most direct interaction with parents and infants.

Nurses, midwives staff /students, who provide care for pregnant women and infants, were involved in this study and they are identified as 'neonatal healthcare providers' through this thesis. This study did not involve medical staff, recognizing they could not commit sufficient time for effective involvement at the proposed time of study and because neonatal healthcare providers have more direct contact with mothers and parents. A more extensive study could involve medical staff and will also involve parents and other caregivers.

As shown in the Figure 3.3, in phase-one, the researcher targeted the maternal-child units at KAUH, where around 350 of neonatal healthcare providers were working or training. The researcher invited them all to complete a questionnaire survey prior to the implementation of the JSEP to examine their current knowledge of SIDS, SIDS resources they use and their capacity to educate parents, their families and other child caregivers about SIDS risks and prevention practices. A total of 231 participants completed the survey. In addition, as part of Phase one, the researcher conducted a series of observations of the neonatal units to observe infant positioning practices for healthy and medically stable preterm/full-term infants sleeping in open cots in the neonatal units at KAUH.



3-3: Sample selection

In the phase-two, the researcher targeted a sample of 120 neonatal healthcare providers from the original 231 to expose to the JSEP. The researcher also invited them to complete a post-test questionnaire following the intervention, to examine the impact of the intervention on their SIDS knowledge, SIDS resources they used, and capacity to educate parents and caregivers. The researcher was unable to include the entire original sample (N=231) in the intervention stage due to work and time constraints of the participating clinicians. In addition, the sample size was determined sufficient for statistical analysis to compare the pre and post intervention data in the intervention phase at 80% power and $p<0.05$ significant level.

In Phase three, the researcher selected a purposive sample of twenty individuals, who were exposed to the education intervention to participate in the focus group discussions. The power of purposive sampling lies in selecting participants who have extensive information about the study topic, to allow the researcher to deeply investigate the problem (Oatey, 1999).

3.4 QUANTITATIVE STUDY INSTRUMENTS

The instruments used in the quantitative study were the infant sleep positioning observation form (Appendix-1) and a modification of the *Infant Sleep Position Questionnaire (ISPQ)"*, a standardized questionnaire exploring knowledge and parental/family instruction practices

(Appendix-3). These instruments were evaluated to confirm their validity and are appropriate to use in this study as confirmed by the study's KAUH advisory group. This group involved ten neonatal healthcare providers who have worked with pregnant women and infants in North Jordan (personal communication). These included neonatal nurses, midwives, and maternal-child health postgraduate students, who had previously worked at KAUH or currently have affiliation work with KAUH. The advisory group also supported the researcher in implementing the JSEP, as they become volunteer trainers for the targeted neonatal healthcare providers (their second role as volunteer trainers discussed in the phase-two of data collection, in this chapter). In addition, they evaluated the qualitative instrument for the focus group scripts.

3.4.1 Infant sleep positioning observation form

As discussed in the literature review, a number of SIDS research studies use observation of infant positioning practices in healthcare settings and childcare settings to evaluate SIDS-safety positioning practices among neonatal healthcare providers and childcare providers (Aris et al., 2006; Gelfer et al., 2013; McMullen et al., 2009; Moon et al., 2008). This method is regarded as an effective companion data collection process to further strengthen results rather than relying on self-report only. For this purpose, the researcher created an observation form to record the healthcare providers' infant sleeping positioning practices for healthy and medically stable infants in the hospital during phase-one and phase-two data collection. The advisory group reviewed the infant sleeping observation form for content and for response processes and endorsed its use as appropriate given the aims of the study. The infant sleeping observation form recorded the infants' sleeping positions (back, side or stomach) through visual observation at each observation time during the day shift or night shift. The personnel filling out the infant sleeping observation form recorded the date and location of the observation.

As the focus of this study is the staff behaviour working in the neonatal units, each infant could be observed more than one time. Infant observations were conducted two times a day; in the morning shift and the evening shift. The neonatal healthcare providers remained unaware that the infant positions were being observed to decrease any potential bias. The sample size of 403 observations for infant sleeping positions was sufficient for statistical analysis for this observational data collection at *80% power* and $p<0.05$ *as significant* was

determined to be minimum of 300 observations in each pre-intervention group and post intervention group. (Kadam & Bhalerao, 2010, p. 55) stated that:

> If we include very few subjects in a study, the results cannot be generalized to the population as this sample will not represent the size of the target population. Further, the study then may not be able to detect the difference between test groups, making the study unethical.

3.4.2 Neonatal healthcare providers' survey-questionnaire

As discussed in the literature review, little is known about Jordanian neonatal health care providers' knowledge and parental educating practices regarding SIDS. Any Jordanian study needs to establish baseline information exploring and describing Jordanian healthcare providers' knowledge and education practices for parents and caregivers regarding SIDS risks and prevention practices. Future research can establish a similar baseline for Jordanian families.

The researcher obtained permission from the author (personal communication in June, 2011), the American instrument, *"Infant Sleep Position Questionnaire (ISPQ)"* (Appindex-2), developed by (Aris et al., 2006) for was used this study. The ISPQ questionnaire had been used in previous studies which confirmed its validity and reliability (Aris, et al., 2006). As discussed in the literature review, Aris, et al (2006) used this questionnaire among 252 neonatal nurses in five hospitals in New York State, to explore their knowledge of SIDS and to determine the content they provided to parents for SIDS instruction. Aris, Cote-Arsenault, and Stevens (2013) used this instrument again in another study conducted in a hospital in New York State, as pre/post-test investigated the changes on knowledge, practices, and parental instruction among sample of 84 neonatal nurses' following their exposing to a hospital SIDS education intervention.

The ISPQ questionnaire contained 29 questions; 10 measured demographic data and 19 were structured questions that utilised categorical, rating and Likert scale responses. Some had a multiple response set which allowed the participants to select all applicable choices. The structured questions measured key concepts about: a) knowledge of SIDS-safe infant sleeping positions, b) perceptions of safety of sleeping positions; c) SIDS prevention knowledge and the agreements with the SIDS risks prevention recommendations; d) SIDS education practices, and how often SIDS education was discussed with parents; e) advice on infant

sleeping practices (sleep position, bed-sharing, clothing, clothing and heat management; the risk of objects on infants' beds; the use of pacifiers at bedtime).

Pilot Test for the ISPQ in Jordan

The purpose of the pilot test was to evaluate the readability, clarity and understanding of the ISPQ for the Jordanian neonatal healthcare providers. The pilot test was also informed appropriate demographic questions for the study. This considered two aspects of the tool's validity; face validity and content validity relating to logically and transparency of the entire test and the motivation of participants to use the entire test. It examined whether the research instrument tested what the researcher wanted to test, and whether the purpose of the entire test was clear and fitted the purpose of the research (Bornstein, 2013).

The pilot test for the ISPQ was undertaken by the advisory group, who met twice in a period of two weeks in a favourable place, and were provided with an Information Sheet about the study and an ISPQ questionnaire to complete and discuss. Having two different meeting times for each group over a fortnight gave the researcher an opportunity to observe any problems with content, completion process, or questions.

The pilot test indicated that the ISPQ questions measured knowledge, perceptions and practices regarding SIDS risk prevention, which met the study's purpose. The questions were categorised is explained in Table 3.2. The ISPQ pilot test did not point to any difficulty understanding the test and confirmed the time needed to complete the questionnaire was approximately 15 minutes. It did however suggest minor changes to some of the questions in order to make them more appropriate to the study.

Table 3-2: Categorised questions

Category	**Questions**
Knowledge questions	3, 6, 14, &15
Perception questions	2, 4, 5, 16, 17, 18, & 19
Education practice questions	1, 7, 8, 9, 10, 11, 12,& 13
Demographics questions	20-29

Necessary modifications were made to the ISPQ questionnaire to include the most relevant questions for the Jordanian study and to suit the study purpose, setting and participants. Some questions were omitted to avoid repetition. The multiple answer set questions were reorganised so that one correct answer could be chosen, as required for statistical purposes and to decrease the bias by some participants choosing all answers haphazardly, without reflecting their actual response. The following modifications were made to the ISPQ questionnaire.

Structural Questions

- The pilot test indicated that the questionnaire did not measure knowledge regarding proper infant sleeping positions, only perceptions about the safety and practice of each position. Consequently the first question was changed to measure the level of knowledge of the proper sleeping position for healthy infants. Question two and three were omitted due to the fact that participants being employed in different maternal and child care units including NICU, which was not reflected in the questions. Practice questions were simplified by replacing “level 2 and higher nurseries in your...” with “the hospital” because the study had been conducted in seven different units at KAUH (nursery, NICU, antenatal, postnatal, labour, maternity clinics and paediatric clinics).
- Questions 7 to 13 measured the practice of educating parents in the discharge teaching plan. Before question 7 on the ISPQ questionnaire, the author stated: “...the following question is about anticipatory guidance (discharge teaching) that is given to parents of infants being discharged from the level 2 and higher nurseries in your hospital.” The advisory group pre-test suggested this lead in would be confusing to KAUH staff. Therefore, after question 7 the author also wrote: “The following questions are about your experiences in giving discharge instructions to parents in the level 2 and higher nursery”. These two sentences were deleted and only one statement placed in before question 7: “the following questions (7-13) are about education practices” to make the question more suited to the study setting. It also explored the education practices amongst all study participants since staff provided parents with education any time, not only prior to the infants’ discharge. Furthermore, the study was conducted in different maternal and child care units.
- Question 10 was deleted as it was only recommended for inclusion after the hospital had developed a policy to educate parents regarding SIDS. The choices of “foster parent and other” in question 10 was also not appropriate to Jordanian culture.

- The presentation of Question 11 was changed without affecting the meaning. The original question was: “Soft objects such as pillows, stuffed toys, quilts and bumper pads are often gifts that parents receive for their babies. When discharging infants from the level 2 and higher nursery, what do you tell parents about the safety of the infant sleeping with the following objects? (Check one answer for each object).” This was simply changed to: “It is usual that soft objects such as pillows, stuffed toys, quilts and bumper pads are available in infants’ bed and sometimes parents received this as a gift for their infants. What advice do you provide to parents about the safety of these objects?” in order to better reflect the study setting since the hospital did not provide such gifts, yet these objects were frequently present in infants’ beds in Jordan.
- Question 6 was related to knowledge about trachea anatomy. The pilot-test group recommended that this question be deleted as the targeted population comprised health promotion and fourth-year nursing and midwifery students who had undertaken theoretical and clinical courses about human anatomy. Pilot-test feedback also indicated that the targeted population had already received intensive training in Cardio-Pulmonary Resuscitation (CPR) where trachea anatomy had been discussed. It was therefore logical to conclude that they would know this information.
- Question 19 was changed from six choices (strongly agree, agree, neutral, disagree, strongly disagree, no opinion) for level of agreement with SIDS-prevention strategies, to a five-point Likert scale measuring perceptions regarding SIDS-prevention strategies. “No opinion” and “neutral” were replaced with “neither agree/nor disagree”. The revised, more appropriate scale included “strongly agree”, “agree”, “neither agree/nor disagree”, “disagree”, and “strongly disagree”.
- The ISPQ pilot test recommended that point 7, “home apnoea monitors reduce the risk of SIDS” not be included, since a home apnoea monitor is rare in Jordan as they are usually expensive and not commonly used by families with a low or medium income.
- In question 4 the word “mildly” was deleted from “mildly agree or mildly disagree” as it did not add any value or meaning. Instead, this question was incorporated as a point of agreement in question 19 for more logical presentation. It was also deemed inappropriate to place this question before question 14 as it may have created bias.

Demographic Questions

All demographic questions in the original ISPQ were changed because they were inappropriate for the study setting. The researcher created new demographic questions more

suited to the Jordanian culture and the Jordanian hospital setting, based on feedback from the pilot test. There were 9 questions in the original American ISPQ. Of these, eight were amended for the demographic section of the Jordanian study (see appendices). Questions were included in the demographic section to obtain information about: training/working units, training/working periods, training/working capacity, highest education level, most common shift, gender, and age range. A question was also added to indicate whether the participant had ever received SIDS education. Pilot–test feedback regarding the demographic questions guided the following decisions:

- Not to ask for private information like telephone numbers. The reason for this was that some participants may have been deterred from filling in the survey if any identifiable information was requested. It was also an ethical consideration for the hospital not to include any private information or identification in the survey to protect the privacy and safety of the participants. Some participants feared losing their jobs if they were found to have provided inaccurate information about their knowledge, perceptions or practice, so instead of asking for personal contact details, it was proposed that the researcher assign a reference number to each participant in the pre-test survey. This reference number was reused in the post-test survey which included a question to indicate whether the participant had filled in the pre-test survey. If so, they were required to provide the pre-test reference number, and in this way the researcher was able to match up the pre and post-test surveys.
- A question was included in the pre-test survey to indicate if the participants had ever received education about SIDS risk-prevention strategies. If so, they were asked to include the time and place of that learning. This was necessary to reduce bias and exclude surveys of participants who had not been involved in the study.
- In the original ISPQ, Question 24 was excluded from the demographic section viz., “have you or someone you know lost an infant to SIDS? If yes, what was your relationship to the infant and did you provide grief support?” The rationale for removing this question was that a number of infants frequently died from critical conditions that may not have been related to SIDS. The pilot group indicated that responses to this question may be difficult due to the uncertainties around diagnosing SIDS-related deaths. From an ethics perspective it was also better incorporated into the interviews, as it may have caused the participants some distress.

After the changes recommended by the pilot-test participants were addressed, the researcher utilized the revised instrument, the modified ISPQ (Appendix 3), to examine knowledge and perception regarding SIDS risks and SIDS prevention recommendations, as well as practices of educating families on these issues. The modified ISPQ was managed by the survey software *Qualtrics* (2009). The ISPQ was in English, the official language of instruction for all health specialisations in Jordan; it was, however, translated to Arabic (required for ethical approval process) and both were reviewed by the pilot-test group for the final revision and endorsed its use as appropriate given the aims of the study, readability and understanding, and culturally appropriate and suitable to use in Jordan. The modified ISPQ was used during Phase-one and Phase-two data collection periods.

3.5 QUALITATIVE STUDY INSTRUMENTS

In order to structure the focus group discussions, the researcher developed a set of open-ended and non-leading semi-structured questions, focusing on questions relevant to the goals of the study (see appendix 4). Using open-ended and non-leading semi-structured questions and piloting these questions reduce the bias (Jamison & Williams, 2003). The advisory group reviewed the focus group scripted questions and provided feedback with regard to their emotional and psychological impact on two different occasions to make sure it was appropriate for use in the study setting and that it maintained an acceptable level of credibility and rigour. The focus group questions included the identification of any changes in the role of participants in the prevention of SIDS, their awareness of SIDS risks and their attitudes and beliefs regarding SIDS risk and prevention measures as a result of the intervention. The focus groups discussions thus indicated whether or not there had been positive change regarding the SIDS-safe practices. It also investigated healthcare providers' usual practices regarding ways to reduce the risks of SIDS both inside the hospital and in their own homes. In addition, it explored their education practices for families in the hospital and within their community. Participants were asked about existing challenges to providing SIDS-prevention education inside the hospital and within their communities. This was followed by suggestions for solutions to these challenges.

3.6 ETHICAL CONSIDERATIONS

This study was approved to conduct in Jordan between 2011- 2013, by both the KAUH Institutional Review Board (IRB), with approval reference 19362011 and the ECU Human Research Ethics Committee (HREC), with approval reference 7536.

The researcher formally requested the KAUH Directory Department's consent to conduct the research and provided a summary of the research topic and its aims. That request was then forwarded to KAUH ethics committee (IRB), which requested a copy in Arabic of all tools and instruments used in the project. The questionnaire, Consent Form and Information Letter were translated into Arabic and reviewed by a professional editor. Arabic and English versions of all the tools and instruments, together with a copy of the research proposal were then submitted for review to an expert panel working with the IRB. The IRB kept a copy on record in Arabic for future requests for the information from non-English speaking people.

Following IBR approval for the study, the Directory Department of KAUH provided written permission and a reference number for the study. The researcher was given a nametag and ID number identifying her as a legal researcher and facilitating access to the targeted hospital units. The researcher then contacted the nursing director and obtained permission to contact the key stakeholders in the targeted units to inform them about the research. The project was conducted according to the principles of the National Health and Medical Research Council (NHMRC, 2009). In accordance with the ethics approval, an Information Letter was provided to each participant (Appendix 5 and 6) to ensure they understood their obligation to maintain confidentiality. Focus group participants were also asked to sign a Consent Form (Appendix 7).

The research maintained the highest levels of privacy, anonymity and confidentiality throughout the study. The survey and the information Letter were distributed to each participant. The Information Letter assured participants that their anonymity would be preserved and informed them that the completed questionnaires would not be identifiable. The researcher advised the focus group participants prior to signing the Consent Form that their participation was voluntary. Participants were also notified that they had the right to withdraw at any time, or retract any information given to the researcher without any disadvantage or consequences. Participants' permission was sought and obtained to make a

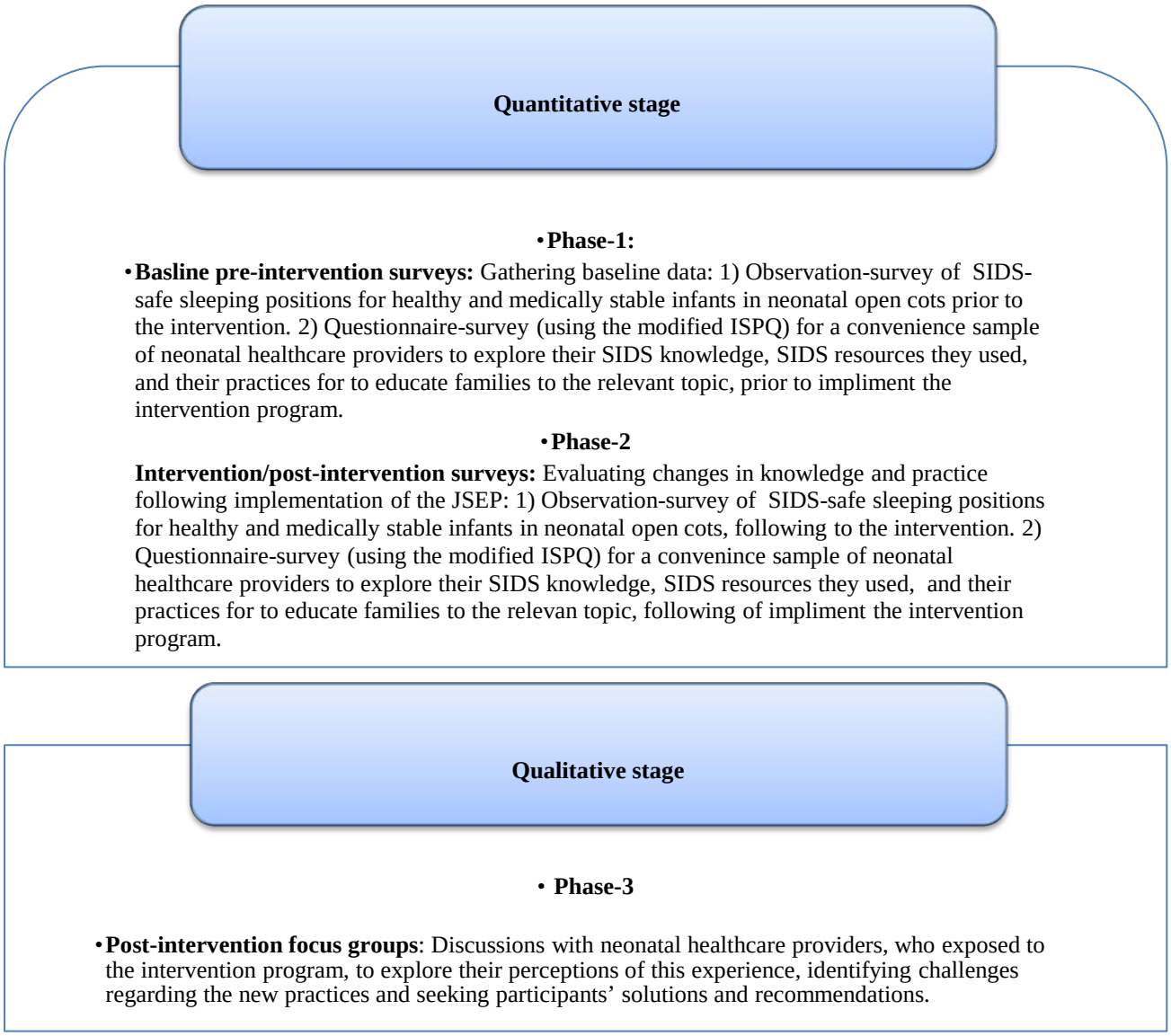
digital recording of all focus group discussions. The researcher notified the participants when the recording started and when it ceased. They were told that if a participant became distressed during the group session, the focus group would be stopped immediately and the recorder switched off. Participants were advised that they could use the counselling service at the hospital if they felt distressed later on.

For infant position observation in the neonatal units at the hospital, the researcher ensured the privacy of the infant's health information and no identifying information was collected, even the infant's date of birth, the infant's hospital code, or gender which usually appears on each infant' cot. Consent was not required from neonatal staff, as no individual information on any healthcare providers was collected, only aggregate data.

All data collected from individual participants will remain strictly confidential and no reference to individual participants will be made in any resulting publications. Signed Consent Forms have been filed away in a filing cabinet and all data sources, including interview recordings, questionnaires, field notes, chat room communication, and conference notes have been locked in a secure place. Electronic data has been stored in a password-protected desktop computer. Hard copies of the data will be kept for five years after the conclusion of the project, after which it will be destroyed. To ensure that confidentiality is maintained, only the researcher has access to the data.

3.7 DATA COLLECTION

This study consisted of three main data collection phases, as summarised in Figure 3.4, which shows the activities and describes the specific data collection of each phase.



3-4: Data collection process

3.7.1 Phas_1: Pre-intervention baseline data collection

- ❑ Do neonatal healthcare providers practice SIDS-safe positioning for infants sleeping in cots in the hospital setting?
- ❑ What knowledge, perception, and beliefs do neonatal healthcare providers have regarding SIDS-safe positioning practices?
- ❑ Are the hospital's neonatal healthcare providers aware of the current SIDS risks and prevention guidelines or resources to obtain SIDS risks and prevention practices information?
- ❑ Do the hospital's neonatal healthcare providers provide families with any education relevant to this topic?

To answer these research questions, phase-one involved two main surveys for data collection, using the quantitative instruments previously discussed. The first survey was a cross-sectional observation about positioning practices for healthy and medically stable preterm/full-term infants sleeping in open cots in the neonatal units at KAUH. The second survey was a cross-sectional ISPQ questionnaire investigating neonatal healthcare providers' SIDS knowledge, SIDS resources they used to access the information, and their SIDS education practices for families in Jordan, prior to development and implementation of hospital-based SIDS intervention program targeted the neonatal healthcare providers.

Pre-Intervention Observation-survey for Infants' Sleeping Positioning Practices

An assessment of sleeping positions for healthy and medically stable infants' was undertaken by visual observation of the neonatal cots at KAUH. Over a period of week, sleeping positions were observed in all occupied cots once during each of two shifts (day/night). In the day shift, the observations were made between 10:00 -11:00 hours and in the night shift, the observations were made between 22:00 hours and 23:00 hours. To decrease any potential bias, a blended measurement was used and the staff remained unaware that the infant positions were being observed to decrease any potential bias. Two volunteers supported the researcher and used the infant sleep observation form to carry out these observations.

The data analysis for infant sleeping positions; a total of 403 observations for infant sleeping positions were gathered over one week in all occupied cots at KAUH. The observational data recorded in the observation form was analysed using IBM-SPSS statistical software version Descriptive statistics were used to measure frequencies and proportions of the SIDS-safe sleeping positions to evaluate the healthcare providers' practices for providing the right SIDS-safe sleeping positions.

Pre-intervention ISPQ questionnaire-Survey

The researcher conducted a cross-sectional descriptive survey using *the modified ISPQ instrument* to explore baseline data information regarding SIDS Knowledge, SIDS resources they used to access the information, and relevant parental/family instruction practices, among convenience sample of neonatal healthcare providers. The survey was distributed manually to the neonatal healthcare providers in the maternal-child units and was also available online to maximise the responses. Participants were provided with a flyer accompanied by an Information Letter about the study and the survey link. Each of the maternal-child units also displayed the invitation and information about the study in their respective areas. [Note: this survey was part of larger study (unpublished) conducted in major teaching hospitals provided maternal-child healthcare services in North Jordan. Only KAUH was targeted to pilot the SIDS education package].

The final pre-intervention survey sample comprised 231 participants who completed the pre-intervention baseline ISPQ survey. The descriptive statistics produced for all data sets using the IBM-SPSS statistical software version 19, included frequencies, and proportions.

3.7.2 Phase-2: Intervention/post-intervention data collection

- ❑ Does the JSEP improve the SIDS-safe infant positioning practices by neonatal healthcare providers in the hospital setting?
- ❑ Does the JSEP improve the SIDS knowledge, and ability to access appropriate SIDS resources among a convenience sample of neonatal healthcare providers in Jordan?
- ❑ Does the JSEP improve the practical ability to educate families regarding SIDS risks and prevention practices, among convenience sample of neonatal healthcare providers in Jordan?

This phase investigated the impact of the JSEP intervention. The findings from phase-one were used for phase-two for the development and implementation of the JSEP. Field notes and feedback were used to collect evidence and report information during the developing and implementation stages.

The researcher used the modified ISPQ instrument that was used in the first study phase to answer the research questions. Phase-two involved two main surveys for data collection. The first survey was a cross-sectional observation of infant positioning practices for healthy and medically stable preterm/full-term infants sleeping in open cots in the neonatal units at

KAUH following the intervention. The second survey was a cross-sectional modified ISPQ questionnaire investigating neonatal healthcare providers' SIDS knowledge, SIDS resources they used to access the information and their SIDS education practices for families in Jordan, following their exposing to the hospital-based SIDS intervention program.

The Use of Participatory Action Research in Developing the Education Intervention

Working effectively with a range of hospital's key-stakeholders and the hospital's health trainers and health educators to achieve the desired behavioural changes required a combination of the methodical study of a social problem with actions to resolve problems. PAR combined research and theories with political powers to stimulate significant changes and improve individuals, communities and organisations (Fals-Borda, 2001). PAR has been used effectively in healthcare settings and is a significant methodology for intervention, development and effecting change within health organisations, communities and groups (Josif, Barclay, Bar-Zeev, Kildea, & Brittin, 2012; Khresheh, 2007; Loizou, 2013; Reed, 2005; Shaban, Barclay, Lock, & Homer, 2012; Trollvik, Eriksson, Ringsberg, & Hummelvoll, 2013). PAR is considered to be an appropriate methodology in clinical settings to bridge the gap between research and practice (Meyer, 2000). PAR encourages key-stakeholders to think about ways of improving services through linking reflection and action in an open, documented way and involves a collaborative approach in which participants identify their problems and create plans to deal with them (Fals-Borda, 2001; Quixley, 2010). Finally, PAR empowers staff to participate in the change process (Boog, 2003; Meyer, 2000; Pope & Mays, 2007).

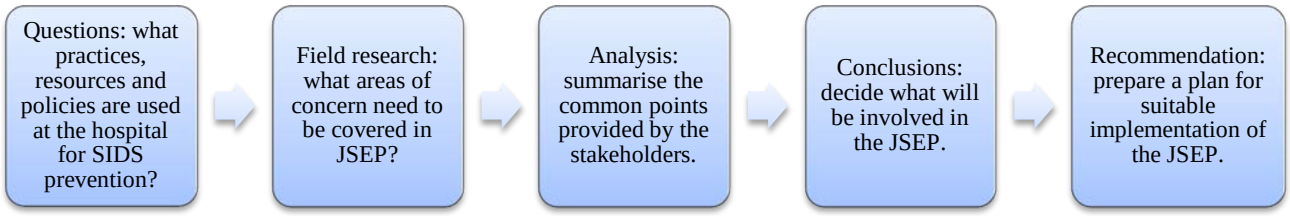
Action Researcher Role

The role of the action researcher is as planner designer, leader observer, catalyst reporter, teacher listener, and synthesiser facilitator (Simpson & Chow, 2008). In this study, the researcher participated in each of these roles as required at each stage of developing and implementing the JSEP. The researcher also acted as facilitator and consultant to hospital's key-stakeholders, and engaged neonatal healthcare volunteer trainers to determine how the JSEP would be developed and implemented. PAR is characterised by a sharing of power between all stakeholders who take responsibility for their own critical analysis, evaluation, management and interaction with the researcher and staff, with the result that they all learn gradually and openly by testing ideas in action, and progressively finding solutions to bigger problems (Quixley, 2010).

Process of Developing the JSEP

Involving the KAUH key-stakeholders (six medical and nursing coordinators from maternal-child units) was essential to defining the purpose and nature of the JSEP. The researcher helped the key-stakeholders to make decisions about actions for improvement of the SIDS education practices among the neonatal healthcare providers. The researcher obtained stakeholders' ideas, suggestions and opinions via direct contact meetings and telephone. This group met three times over a week. In addition, in accordance with the advice of Bresciani (2004), the researcher, presented a summary of the literature on the known risk factors of SIDS, other background on the study, its purpose, ethical considerations .

The following meetings were based on the ideas proposed by Quixley (2010), see Figure 2.2. The second meeting, the researcher involved the key stakeholders in discussions of the report summary of the main findings of the baseline pre-intervention data collection. The key-stakeholders were encouraged to think about the problem/s and if there any resources and policies are currently used at the hospital for SIDS prevention. The Stakeholders were encouraged to find solutions and to indicate the main area of their concerns and help the researcher to investigate all possible avenues for implementing the JSEP; opportunities and ways for participants to effectively communicate SIDS-prevention messages to families.



3-5: Preparing the JSEP based on PAR structure (Quixley, 2008, p. 9)

Then the researcher summarised all ideas and feedback provided by the key stakeholders and also used field notes to find the complete view about the problem and the solutions. The researcher and the key-stakeholders then met again for the third time to decide what the final content of the education package would be and prepare and confirm a suitable plan for the implementation, which met the project's objectives, timeframes, and fitted in with hospital staff's commitments.

The Final JSEP Education Intervention

The final JSEP was developed based on the literature reviewed for SIDS, SIDS risks relevant to the Jordanian setting and reduction measures, and effective educational strategies, as discussed in the previous chapters (introduction and literature review). The other important component for developed the final JSEP was the key-stakeholders' feedbacks, as well as the field notes taken by the researcher. In summary, the final JSEP was included the following educational strategies:

- Recruitment group of hospital-based volunteer trainers to support implementation of the JSEP; The researcher and stakeholders involved in organising this group to support the study (personal communication).
- Establishment of a SIDS education workshop to be conducted by the main research investigator to train and prepare the volunteer group to deliver the education to study participants and support the JSEP throughout the project.
- Provision of a list of available resources on SIDS for the hospital's CEP website including a database of electronic articles, links, and a list of journals and books available on the subject at the medical library;
- Display of SIDS posters on the hospital's walls in the maternal-child units;
- Supplying the healthcare providers with written educational material produced in both Arabic and English.
- The conduct of multiple 30-minute small-group SIDS-education sessions by volunteer trainers for healthcare providers;
- The conduct of regular meetings for change maintenance and follow-up support (15-minute seated discussions at the beginning or end working shift, held weekly in each maternal-child healthcare unit).
- The volunteer trainers continuing to contact and support the participants during the follow-up.
- The conduct of Post-intervention observation for infant sleeping positioning practices.
- The conduct of Post-intervention ISPQ-questionnaire survey for SIDS knowledge and family education practices.

The JSEP included SIDS-educational materials adapted from SIDS & Kids in Australia, AAP, American SIDS institute, and NICHD in USA (see Appendix 8). All education materials were reviewed by the PAR stakeholders to ensure they were clear, suitable for use in the hospital, and appropriate to Jordanian culture.

Implementing the JSEP

As shown in Table 3.3, the JSEP was implemented over five stages in an eleven week period. All activities during the implementation stage were managed by the researcher in cooperation with the hospital's CEP and the key stakeholders. In addition, throughout the seven-week implementation and follow-up period, the researcher allocated two days a week to supporting

the volunteer trainers and keeping abreast of progress. The researcher used field notes and feedback reporting strategies to provide a record of events, activities and progress throughout the implementation period.

Table 3-3: Stages of implementation the JSEP

Stages	Duration	Activities
Stage 1	2 week	Train-the trainer education
Stage 2	3week	Hospital education for neonatal healthcare providers
Stage 3	4 week	Post-education support
Stage 4	1 week	Post-intervention observations for infant sleeping positions
Stage 5	2 week	Post-intervention *ISPQ* questionnaire survey

Stage1: Train-the-Trainer Education

In the first two weeks, the researcher trained the volunteer trainers. This model of 'train-the-trainer" has been shown to be an effective strategy in SIDS education. For example, Moon, et al. (2008, p. 788) states "A sudden infant death syndrome risk reduction curriculum using a train-the-trainer model is effective in improving the knowledge and practices of child care providers. Three education workshops were provided to the volunteer trainers over two weeks. The volunteer trainers were encouraged to play an active role in educating healthcare providers regarding SIDS and relevant prevention recommendations. These meetings focused on behaviour, motivation, counselling, and SIDS-intervention education, as well as how to demonstrate prevention measures to parents and caregivers. Role-play exercises and a range of media were used to communicate information. At the end of these sessions, the researcher provided resource booklets to reinforce their information gained in the workshops and to use in their education sessions to the healthcare providers.

Stage 2: Hospital Education for the neonatal healthcare provider participants

In the following three weeks, the volunteer trainers started delivering the SIDS education sessions. Six education sessions were delivered over three weeks. Each session was provided to around 20 participants in two conference rooms in the targeted units. Each 30-minute session included a presentation by two volunteer trainers and a ten-minute question and answer period at the end. Resource booklets (English and Arabic) were provided at the staff counter reinforced the information gained in the education sessions. The education materials

and resources were also available in the hospital's CEP. The participants who attended the educational sessions were asked to provide a contact email address to invite them to participate in the post-test survey and post-interventional focus groups. A convenience sample of 120 neonatal healthcare providers was exposed to the JSEP, at KAUH.

Stage 3: Post-Education Support

In the four weeks follow-up period, the volunteer trainers, during the course of their normal duties, provided regular support to the neonatal healthcare providers and taught the JSEP to new staff. In addition, they provided information to existing staff and were regarded as positive role models. The 15-minute discussion meetings were run by volunteer trainers and supported by the staff coordinator in the targeted units and the researcher was also available for support. The regular 15-minute meetings during the follow-up period encouraged participants to play an active role in educating parents on SIDS by providing pamphlets in simple Arabic that effectively publicised SIDS-prevention messages and were specifically designed to educate families using graphic images to communicate the information and convey the required skills these parents could easily understand. In addition, the trainers encourage healthcare providers to run multiple 15-minute small-group SIDS-education sessions for families. As discussed in the literature review, these strategies have been shown to be effective for educating parents about SIDS (Moon et al., 2004). The volunteer trainers supported the researcher to keeping abreast of progress.

Stage 4: Post-Intervention Observation for Infants' Sleeping Positioning Practices

In order to evaluate changes in infant sleeping positioning and identify whether the neonatal staff's practices had improved, infant sleeping positions for healthy and medically stable infants' in the neonatal cots were observed again over one week following the implementation of the JSEP. The post intervention observations were run once during each shift between 10:00 -11:00 hours and between 22:00 hours and 23:00 hours using the same blended measurement used in the pre survey. Staff remained unaware that the infant positions were being observed to decrease any potential bias. Two volunteers supported the researcher and used the infant sleep observation form to carry out these observations. Sleeping positions were observed 400 times following the intervention.

Data analysis for infant sleeping positions; the observational data recorded in the infant sleep observation forms was analysed using IBM-SPSS statistical software version 19. Descriptive

statistics were used to measure frequencies and proportions of the SIDS-safe sleeping positions before and after implementation of the JSEP. The Chi- square test was used, as an appropriate test to compare two independent groups of infants and evaluate the changes in the infants' sleeping positions following the JSEP.

Stage 5: Post-Intervention Modified *ISPQ*-Survey

The researcher used the modified ISPQ again as the post-test survey among the convenience sample of nurses and midwives in maternal-child healthcare units at KAUH who had been exposed to the JSEP. The post-test modified ISPQ survey explored the JSEP participants' SIDS Knowledge and SIDS resources they used to access the information following the hospital-based SIDS educational intervention program. It also explored their SIDS education practices to families in Jordan. As in the pre-phase, JSEP participants were provided with a flyer, including the survey link, inviting them to complete the online post-test modified ISPQ survey. The post-test survey was conducted online to minimise interference in hospital daily routine and for ease of completion for hospital personnel, particularly amongst nursing students with heavy academic and exam workloads. To ensure that participants received the information, the post-test study invitation and survey link was emailed to the participants' individual email addresses. The post-test survey was emailed only to participants who had been exposed to the JSEP. Each of the targeted units also displayed the invitation and information about the study in their respective areas.

Data analysis for the modified ISPQ; This included evaluation of the impact of the JSEP on participants' responses to the modified ISPQ. The data analysis therefore, included only participants who had received the SIDS education and completed both pre-test and post-test surveys. To control bias, participants who filled one survey only, whether pre-test or post-test, were excluded from the data analysis. Questionnaires with missing data were also excluded from pre- and post-test comparisons. The final sample comprised a comparison of 103 participants who completed both the pre-test and post-test ISPQ surveys and had participated in the JSEP.

The descriptive statistics produced for both pre and post intervention data sets using the IBM-SPSS statistical software version 19 included frequencies, proportions, means, medians and standard deviations. Analysis of continuous data was summarised using median and inter-quartile ranges. All questions were coded on a rating scale such as (accurate, mix, and

inaccurate knowledge, perception, or advice). The differences in responses to these pre and post-test questions were examined to identify any significant differences of regarding knowledge, perceptions and practices. To compare group differences between PRE and POST intervention data, Non-parametrical, Wilcoxon tests were used, the appropriate test for comparing changes in continuous data involving rating and Likert scales. All tests of significance were conducted at the level of significance P-values < 0.05.

3.7.3 Phase 3: Post-intervention focus group data collection

- What are the challenges and future directions for SIDS prevention in Jordan?

Phase-three involved post-intervention focus groups with a purposeful sample of neonatal healthcare providers exposed to the intervention program. These focus groups obtained their experience of the intervention program; it also shed light on challenges for SIDS prevention and obtained recommendations for improvements of the intervention for future application. Focus group are an effective method to explore participants' feelings, perceptions, beliefs, opinions and ideas about the intervention (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2007) and to stimulate interactive discussion about how to improve the program for future clinical personnel. Focus groups provide an opportunity for in-depth discussion of important points (Lindlof & Taylor, 2002), and in this study, focus groups enable the researcher to gain rich information in a short amount of time and were cost efficient.

Focus Group Recruitment

Focus groups involve different participants with similar experiences and interests and group dynamics help participants to build on each other's ideas and comments (Wiesenfelder, 2011). Purposeful sampling is used to select a sample that the researcher believes will provide the richest information based on the research problem (Bresciani et al., 2004). Therefore, the researcher purposefully sampled the focus groups to include individuals were able to provide the breadth and depth information required for this study. Twenty neonatal healthcare providers exposed to the JSEP were selected for three focus group sessions: two sessions with the neonatal healthcare staff respectively (FG1, n=7; FG2, n=7), and the third session was conducted with neonatal healthcare trainees (FG3= 6).

These focus groups included senior neonatal healthcare staff (staff coordinators, staff heads, and first-in-charge) due to their ability to meet regularly with their staff and obtain

suggestions, ideas and feedback on their experiences. They also have extensive work experience and their regular contact with parents and families and their capacity to listen to comments from parents. They also have sound knowledge of current hospital policies and daily work issues. In addition, these focus groups included a sample of junior staff and trainees, giving them a chance to make their own contributions and learn from the contribution of others, and also provided discussion more general and more productive.

The researcher posted an invitation and Information Letter in both Arabic and English to the focus group participants. After they agreed to be involved in the focus groups, they were asked to provide their contact details so the researcher could send them a Consent Form in both Arabic and English. Consent Forms were signed and returned to the researcher before the focus group and were saved confidentially.

Focus Group Conduction

Focus group sessions were conducted and facilitated by the researcher and commenced at a time and place convenient to the participants. Research recommended focus group settings should be comfortable, easily accessible and with few distractions (Jamison & Williams, 2003). Therefore, focus groups took place in one of the conference rooms of the maternal-neonatal units at the hospital. Focus group participants were familiar and comfortable with the room. The conference rooms were well prepared with all requirements including furniture and refreshments. Dates for the focus groups were coordinated with the hospital and each session lasted between 60 and 90 minutes, the recommended duration for focus groups (Bresciani et al., 2004). Discussions took place in Arabic and English, because the participants and the researcher were bilingual (Jordanian du jour language discussed previously in the study background).

One staff member helped to set up the room for the meeting and was on hand for any technical help and support. Focus group participants knew one another, as they had all worked and trained in the same workplace. The participants wore their nametags during the focus group sessions as they normally do during work and training hours. Each focus group session commenced with a quick summary of the study and the main objectives of the focus group. After the researcher introduced herself to the group, each participant was given the opportunity to introduce herself in turn (Jamison & Williams, 2003; Shenton, 2004).

It is important for focus group mediators to facilitate the effectiveness and flow of the focus groups (Bresciani et al., 2004; Burns & Grove, 2005; Polit & Beck, 2007). The researcher's familiarity with the topic, the participant groups and hospital teams facilitate the flexibility, and flow of the focus groups. The participants felt comfortable to chat and answer questions and built on each other's comments during the conversations. Since the researcher was not one of stakeholders and was working at a different institution, it is likely that participants felt more comfortable to critique the practices, policies and training system at the hospital setting. They freely discussed the challenges affecting their role as educators of SIDS to parents and caregivers, as well as other aspects in relation to working hours and salaries which needed improvement. Furthermore, the participants expressed enjoyment about being involved in the conversations.

Focus group participants were treated respectfully and participants acted as they would normally in their workplace. There was no tension during the meetings. They occasionally asked for the recorder to be switched off when they were needed and interrupted by other staff. The facilitator was familiar with the process of conducting effective focus groups and exercised caution not to provide any verbal or nonverbal opinions or agreement, or to disapprove of any comments made by participants during the sessions, this to decrease the bias and increase the validity of the data (Bresciani et al., 2004; Burns & Grove, 2005; Polit & Beck, 2007). At the conclusion of the focus groups the researcher thanked all participants for their contribution to the research.

Focus Group Data Analysis

Basic interpretive thematic analysis used to describe the experience of participating in the study. The analysis included basic steps for reporting, transcribing and interpreting the focus groups. The thematic analysis interacts directly with data to release major themes and categories, by picking the most relevant significant data (Creswell, 2003).This provides a richness which will work in conjunction with the quantitative data findings to demonstrate the impact of the implementation of the educational program (Burns & Grove 2007). Data was managed using ©QSR NVivo 9 software; guides from Bazeley (2007) and the QRS handbook of *NVivo 9 Basics* (2010).

In the first stage, all focus group recordings were transcribed verbatim on paper in the original language (Arabic). Each focus group was transcribed separately. All data was

transcribed without identifying the participants, instead each focus group participant was given a number so their comments could be attributed without their identity being revealed (e.g. P1-FG1: related to the first participant to make comment in the first group). To ensure there was no data missing, tape recordings were reviewed several times against the written transcripts. After confirmation all data had been documented, all written transcripts were converted into English by the researcher who is fluent in both Arabic and English. Once the transcripts had been converted to English, they were reviewed again to make sure the translations were meaningful. A registered translator reviewed the translations to ensure accuracy of the data. At this point all focus groups' transcriptions were uploaded in to the NVivo software program for detection of themes.

In the second stage, the thematic analysis process rendered review of the transcription texts and highlighting the main codes and sub codes which were organised into similar categories. The categories were then sorted into themes. All audio recordings were re-examined to ensure all repeated words or concepts within the data had been allocated in to a theme. A review for each theme and sub-theme were finalised including a description and illustration with a quotation from the focus group discussions.

In the third final stage, the interpretive validity of the data findings was evaluated. This provided the meaning of the final content from the participants' viewpoints (Alkelani & Alshrifeen, 2011a). Aspects were addressed to interpret qualitative data and highlight the most relevant findings with respect to cultural factors. For this purpose, the final thematic content, in English and Arabic, were returned to the focus group participants. One participant from each focus group was contacted to share the results with their group. They were asked to provide feedback about how well or poorly the themes represented their perspective of participation in the program and the impact this knowledge may or may not have on their future personal and clinical practices in relation to infant care. Focus groups independently reviewed the themes as well as the researcher to evaluate the consistency, postulate the subject interpretation and comment on the adequacy of the theme selection.

The focus group feedback indicated satisfaction with the final content and they concurred that it logically expressed their perceptions of the study experience, as well as how this new knowledge may impact on their personal lives and clinical practice. It also confirmed that the

study setting was a realistic recreation of the active working environment. Data finding being studied were evaluated by familiar group to ensure creditability. This consistency between the researcher's thematic analysis and the perceptions of the focus groups' participants indicates the interpretations and concepts were valid (Alkelani & Alshrifeen 2011b). Some questions were raised about the manner in which their comments had been presented and adjustments made where necessary to remove quotes which participants were not comfortable with. This was considered appropriate and in keeping with the consent process where participants were assured data they were not comfortable with being utilised would be either de-identified (as all participants' comments were) or removed if they felt it might possibly impact negatively on them (identification through the actual statements made). The researcher designed ways to increase the creditability of the final content by obtaining the feedback from the focus groups participants. In addition, being the qualitative research was conducted in the natural settings with few controlling variable adding more strength to the final study findings. (Krefting, 1991). Aspects were addressed to interpret qualitative data and highlight the most relevant findings with respect to cultural factors.

3.8 SUMMARY

This chapter outlined the methodology which included the development and implementation of the JSEP educational intervention. In addition, both qualitative and quantitative methods were discussed. It described the design, target population and samples. Instruments and data collection methods were also discussed with an overview of the data analysis. The next chapter will present the findings from the data collection conducted during this project.

Chapter Four - Results

4.1 INTRODUCTION

The researcher selected King Abdullah University Hospital (KAUH) to test a targeted and tailored Jordanian SIDS education package (JSEP). This chapter describes the results of both quantitative and qualitative data analysis reflecting the three phases of data collection described in the methodology chapter. Phase-one and phase-two included the quantitative data collection. Phase-one investigated whether neonatal healthcare providers practice SIDS-safe positioning for healthy and medically stable infants in the neonatal units at KAUH. It also provided baseline quantitative data regarding neonatal healthcare providers' knowledge of SIDS, resources they used to access SIDS information, and their ability to educate families on SIDS prevention practices. Phase-two provided information about the effectiveness and feasibility of implementation of a hospital-based SIDS intervention program to a sample of neonatal healthcare providers at KAUH. The third phase used qualitative data collected via focus groups with a purposeful sample of neonatal healthcare providers who were exposed to the hospital-based SIDS intervention program, to discover challenges and future directions to reduce SIDS in Jordan and improve the program for the future.

4.2 PHASE 1: PRE-INTERVENTION BASELINE FINDINGS

- Do neonatal healthcare providers practice SIDS-safe positioning for infants sleeping in cots in the hospital setting?
- What knowledge, perception, and beliefs do neonatal healthcare providers have regarding SIDS-safe positioning practices?
- Are the hospital's neonatal healthcare providers aware of the current SIDS risks and prevention guidelines or resources to obtain SIDS risks and prevention practices information?
- Do the hospital's neonatal healthcare providers provide families with any education relevant to this topic?

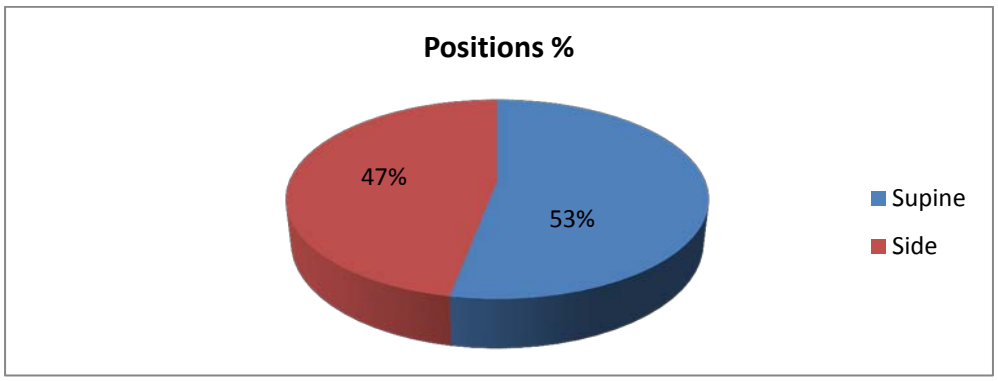
Phase-one is part of a larger study that included a cross-sectional descriptive survey for SIDS-knowledge and family SIDS education practices conducted in the main public teaching hospitals providing maternal-infant health care services in North Jordan. The hospitals that were included King Abdullah University Hospital (KAUH), Princess Badde'a Teaching Hospital (PBTP) and Princess Rahmeh Teaching Hospital (PRUH), results of this larger study are unpublished. This Chapter describes results presented from KAUH, the major hospital in Jordan. Phase-one included two main data collection surveys. The first survey was a cross-sectional observation informed baseline data about positioning practices for healthy

and medically stable infants in the neonatal units at KAUH. The second survey was a cross-sectional ISPQ questionnaire informed baseline data investigated neonatal healthcare providers' SIDS knowledge, SIDS resources they used to access the information and their SIDS education practices for families in Jordan, prior to development and implementation of hospital-based SIDS intervention program. A descriptive analysis of the data was run to explore frequencies and percentages for data presented in this phase.

4.3 FIRST SURVEY: INFANT SLEEPING POSITIONS PRIOR TO THE INTERVENTION

The researcher used the data recorded in the infant sleep observation form to investigate the SIDS-safe positioning practices (supine) in order to evaluate the positioning practices for healthy and medically stable infants and among neonatal healthcare providers in the neonatal units at KAUH prior to the hospital-based SIDS intervention program.

There were a total of 403 observations in the pre intervention phase. The total observations were infants placed to sleep in supine, a recommended SIDS-safe sleep positions, were observed to be only 53% (n= 214) of the time. The rest of observations demonstrated that in 47 % (n= 189) of the observations, infants were placed to sleep on their sides, an unsafe SIDS sleep position (Figure 4.1). Note that none of the infants observed were sleeping in a prone position due to dominant beliefs among Jordanians of risk of this position of suffocation (See Chapter 1 and Chapter 2).



4-1: Positioning practices

4.4 SECOND SURVEY: THE ISPQ QUESTIONNAIRE RESULTS PRIOR TO THE INTERVENTION

The modified ISPQ-instrument was used to determine neonatal healthcare providers' SIDS knowledge, SIDS resources they used for access the information and their SIDS education practices for families, prior to implementation a hospital-based SIDS intervention program.

4.4.1 Demographic profile of neonatal healthcare providers completed the questionnaire-survey

A total of 231 healthcare providers completed the baseline survey prior to developing and implementing the JSEP. Table 4.1 presents the demographic characteristics for the pre-intervention participants. Participants included 36% (n= 82) neonatal healthcare staff. The remaining 64% (n=149) participants were neonatal healthcare trainees. The high percentage of female participants (93%, n= 215) reflects the predominance of female healthcare providers in the childbirth and neonatal units in Jordanian healthcare settings. Forty-seven percent (n= 108) of the pre sample were in the 20 to 25 year old age group, which was the largest group, followed by the 26 to 30 year old age group (33%, n =76) and the remainder was over 30 years of age (20%, n= 47). Sixty percent (n = 138) of the participants held a bachelor's degree, while 70 (30%) had an undergraduate diploma. Ten percent (n= 23) held postgraduate degree. Fifty-seven percent (n= 132) of study participants were working/training in units caring for neonate infants (NICU, Nursery, Postnatal and child healthcare clinics) and 43% (n = 99) of participants were working/training in units which cared for pregnant women and childbirth units (antenatal, labour, and maternal healthcare clinics). Sixty percent (n= 138) had worked/trained in the targeted units for less than two years, 11% (n= 25) worked/trained in the targeted units between two and five years, and the remainder (29%, n= 68) had more than five year experience working in these units. (71%, n= 163) of the participants usually worked the day shifts, students were most often present in the ward areas during day shifts.

Table 4-1: Demographic profile of participants completed the baseline survey-questionnaire

Variable		N = 231	(%)
Capacity of Working/training	Neonatal care staff	82	36
	Neonatal care trainees	149	64
Gender	Male	16	7
	Female	215	93
Age Group	20- 25 years	108	47
	26 -30 years	76	33
	More than 30 years	47	20
Education level	Postgraduate	23	10
	Bachelor	138	60
	Undergraduate Diploma	70	30
Unit of working/training	Neonatal healthcare units (postnatal, NICU, nursery, & child clinics)	132	57
	Pregnancy & Childbirth healthcare units (antenatal, labour & maternal clinics)	99	43
Period of working/training	Less than 2 years	138	60
	2-5 years	25	11
	More than 5 years	68	29
Most common shifts	Day shift	163	71
	Night shift	68	29

4.4.2 SIDS Awareness

The following results indicate healthcare providers' knowledge regarding SIDS risks and prevention practices. These include their knowledge and beliefs about the recommended SIDS-safe sleeping position, and perceptions regarding the relevant safety of each position (supine, side, and prone). It also explored their understanding about SIDS risk and prevention practices. In addition, it explored awareness of SIDS risks prevention guidelines released by the American Academy of Pediatrics and resources used to access SIDS information.

Knowledge, Perception and Beliefs about the Recommended SIDS-Safe Sleeping Position

Knowledge of SIDS-Safe Sleeping Position

This study examined healthcare providers' knowledge about the recommended SIDS-safe sleeping position (supine). The highest percent of participants (45%, n = 106) indicated that using both the side and supine are safe positions for an infant to sleep following by (23%, n = 54) who indicated that the side is the only SIDS low risk sleep position. Only 21% (n= 48) of

total participants identified the accurate response and indicated supine as the safe SIDS sleeping position. See table below.

Table 4-2: Knowledge of SIDS-safe position

Sleeping position	N = 231 (%)	
Supine	48	(21)
Side	54	(23)
Side/supine	106	(45)
Prone	4	(2)
Side/prone	8	(4)
Supine/side/prone	11	(5)

Beliefs against Using Only Supine Position for Sleeping Infants

The study also explored why some participants recommended using sleeping positions other than supine for healthy or medically stable preterm and full term infants. A descriptive analysis was run to explore beliefs evident in responses to this question (Table 4.3). Participants indicated that they recommended against using the supine position for infant to sleep as the only appropriate position because of their beliefs that this may increase the risk of aspiration (33%, n= 76), may cause flat head (12 %, n= 28), and may cause infants to have more reflux (10%, n= 23). Another group of participants (20%, n= 46) cited all three of these beliefs as reasons. Eleven percent believed the supine position might alter quality of sleep and therefore was not optimum for development.

Table 4-3: Beliefs against using only supine sleeping position for infants

Beliefs against using only supine sleeping position for infants	N= 231	(%)
Increase risk of aspiration	76	33
Cause flat head	28	12
Have more reflux	23	10
Mixed reasons (flat head, aspiration/ more reflux)	46	20
Alter quality of sleep/Not optimum for development	25	11
Did not indicate any of the above reasons	33	14

Perceptions regarding the Relevant Safety of Infant Sleeping Positions

This study examined healthcare providers' perceptions regarding the relevant safety of each position (supine, side, and prone). A five point scale of rank was applied, the ranking scores related to perceptions of safety as [1= the position is very safe, 2 = the position is kind of safe, 3 = do not know, 4 = the position is not very safe, through to 5 = the position is not safe at all].

For the question related to safety of supine sleeping position, only 45% (n= 105) of total participants identified the correct response (it is very safe) while another 11% (n= 25) reported not knowing about the level of safety of this position. Seventeen percent (n= 39) of total participants indicated the supine position as not a very safe position and the same proportion indicated it as kind of safe, (Table 4.4).

For the questions related to safety of side sleeping position, only 6% (n= 15) of total participants identified the correct response (it is not safe at all) and another 10% (n= 23) who did not know about the level of safety of this position. Thirty-four percent (n= 78) of total participants indicated the side position as a very safe position and another 30% (n= 69) indicated it as kind of safe.

For the questions related of safety of the prone sleeping position, 61% (n= 141) of total participants identified the correct response (it is not safe at all) and another 9% (n= 20) who did not know about the level of safety of this position. Twenty percent (n= 47) of the participants indicated the side position as not very safe position and another 9% (n= 20) who indicated it as kind of safe.

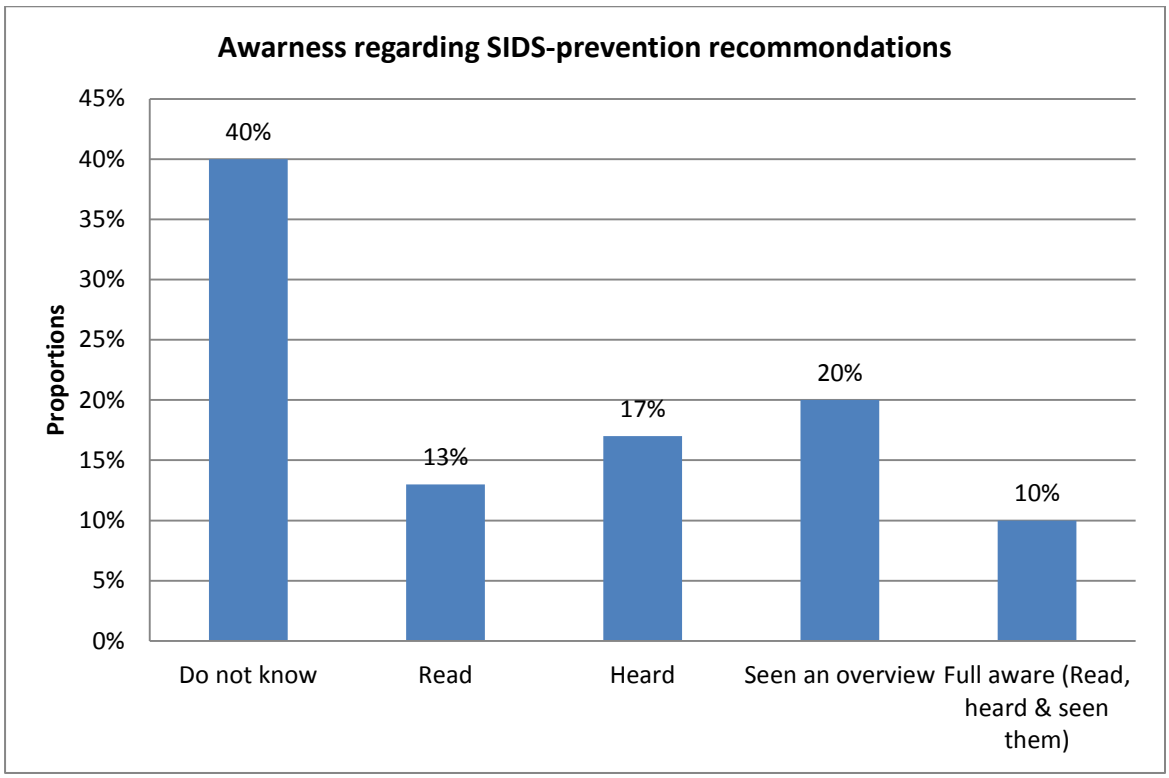
Table 4-4: Perception regarding safety each infant sleeping position

Responses	**Sleeping position, N= 231 (%)**		
	Back	**Side**	**Stomach**
Very safe	105 (45)	78 (34)	3 (1)
Don't know	25 (11)	23 (10)	20 (9)
Kind of safe	39 (17)	69 (30)	20 (9)
Not very safe	39 (17)	46 (20)	47 (20)
Not safe at all	23(10)	15 (6)	141(61)

Awareness of SIDS Prevention Guidelines

The modified ISPQ examined participants' awareness about SIDS-risks and prevention guidelines as proposed by the American Academy of Paediatrics or AAP. The questions in the instrument use a five point knowledge scale [1= Do not know about the guidelines, 2 = Read the guidelines, 3 = I have heard about the guidelines, 4 = I have seen an overview about the guidelines, and 5 = I am fully aware about the guidelines (heard, read and seen)].

As Figure 4.2 shows, 40% (n= 92) of participants reported no knowledge about SIDS-prevention recommendations. Thirteen percent (n= 30) reported they had seen the guidelines, 17% (n= 40) reported hearing about the guidelines, 20% (n= 46) reported having seen an overview of the guidelines, and only 10% (n= 23) reported being fully aware of these guidelines.



4-2: Awareness about SIDS recommendation

Understanding of SIDS Risks and Prevention Practices

This study examined healthcare providers' perceptions regarding SIDS prevention recommendations released by American Academy of Pediatrics (AAP, 2011). A five point agreement level rating scale where [1=strongly agree (SA) to 5= strongly disagree (SD)] was

used for this purpose. In the questionnaire, there were six statements on practices reducing risk of SIDS, five were true and one was false. Table 4.5 below, shows the frequencies and proportions of participants provided the accurate responses (agreements) with the true statements.

Table 4-5: Agreements with True concepts regarding SIDS risks and prevention practices

Participants agree with the TRUE concepts, N= 231	**SA n (%)**	**A n (%)**	**NA/ND n (%)**
Infants should sleep close to parents, but in a separate space	69 (30)	69 (30)	25 (11)
Soft objects (pillows, blankets, & quilts) should be removed from infants' sleeping space	17 (8)	52 (23)	25 (11)
Infants should be given a pacifier when they are put to sleep	8 (4)	34 (15)	27 (12)
Smoking around infants increases the risk of SIDS	37 (17)	69 (30)	36 (18)
Breastfeeding helps to reduce the risk of SIDS	48 (21)	70 (31)	46 (20)

[SA: Strongly agree; A: Agree; NA/ND: Neither Agree/Nor Disagree]

For the first true statement that 'infants should sleep close to their parents but in a separate space' as a practice recommended to help reduce the risk of SIDS, only 60 % (n= 138) of total participants identified the accurate answer and agreed or strongly agreed with this. Another 11% (n= 25) of total participants neither agreed nor disagreed with this statement. For the second true statement that 'all soft objects such as, pillows, blankets and quilts should be removed from the infant's bed,' 31% (n= 69) of total participants' responses reflected agreement or strongly agreement. Another 11% (n= 25) of total participants neither agreed nor disagreed with this true statement For the third true statement that 'infants should be given a pacifier when they are put to sleep to reduce the risk of SIDS,' only19% (n= 42) agreed or strongly agreed and another 12% (n= 27) of total participants neither agreed nor disagreed with this true statement. In addition, the fourth true statement 'smoking in the infant's home environment' which increases the risk of SIDS, only 47% (n= 106) agreed or strongly agreed and another 18% (n= 36) of total participants neither agreed nor disagreed with this true statement. For the fifth true statement that 'breastfeeding helps to reduce the risk of SIDS, only 52 % (n= 118) agreed or strongly agreed and another 20% (n= 46) of total participants neither agreed nor disagreed with this statement

For the only false statement regarding practices to reduce SIDS risks, that 'infants should be clothed so they are warmer compared to adults in the same room', 68% of total participants (n= 155) agreed or strongly agreed with this false statement while another 10% (n= 23) neither agreed nor disagreed (Table 4.6).

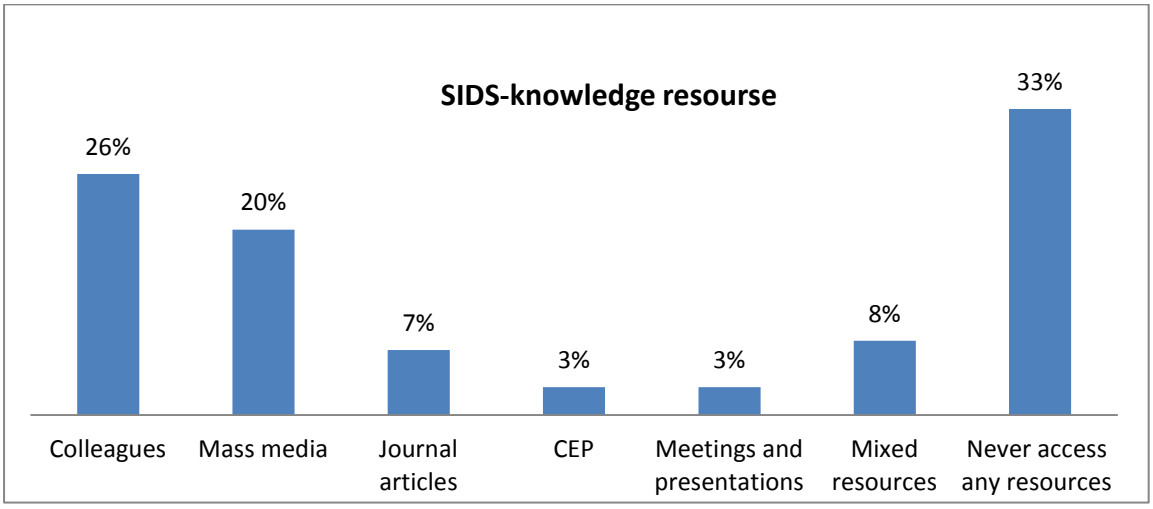
Table 4-6: Agreements with false concepts regarding SIDS risks and prevention practices

Participants agreed with the FALSE concept, N= 231	**SA n (%)**	**A n (%)**	**NA/ND n (%)**
Infants should be clothed so they are warmer than adults	85 (38)	70 (30)	23(10)

[SA: Strongly agree; A: Agree; NA/ND: Neither Agree/Nor Disagree]

Resources access for SIDS Information

This study also explored the sources that the study participants usually used to access the knowledge regarding SIDS risk prevention measures. Thirty-three percent (n=76) of participants indicated that they never access any resources with information about SIDS; 20% (n= 46) access the mass media for the knowledge, and another 26% (n= 58) depended on colleagues advice. Seven percent (n= 15) accessed health journal articles for this information and only 3% (n= 7) indicated that they getting the knowledge via Continuous Education Program (CEP) or via meetings and presentations. Only 8% of total participants (n=19) reported access to knowledge about SIDS from a mixed of all these resources (Figure 4.3).



4-3**: Typical resources for SIDS information**

4.4.3 Parental/family SIDS instruction practices

The next section presents data on healthcare providers' practices in educating Jordanian families regarding SIDS risks and prevention recommendations. These included how often SIDS education was provided to families, what advice they provided regarding infant sleep care practices. These included positioning, clothing and sharing sleep surface, bedding objects safety, and providing pacifiers at bedtime.

Frequency that SIDS Education Was Provided to Families

A five point rating scale [where 1 = never and 5 = always] was used to evaluate how often SIDS education was provided to families in Jordan. The highest percent (46%, n=106) of participants indicated that they never provided families with information regarding SIDS, followed by 33% (n= 75) who rarely provided information (see table below).

Table 4-7: providing the SIDS education to families

SIDS education	**N = 231**	
	n	%
Always	5	2
Usually	8	4
Sometimes	37	15
Rarely	75	33
Never	106	46

Infant Sleep Care Practices Advice

The study explored SIDS teaching practices of providing accurate advice about positioning, clothing and bed sharing provided to parents and caregivers (Table 4.8). The response sets were grouped on a three point rating scale [where 1 = SIDS-unsafe advice, 2 = no advice, 3= SIDS-safe advice].

Table 4-8: Frequencies and percentages on common advice provided regarding infant sleep care practices

Practice	Advice	N= 231 (%)
Positioning	**SIDS-unsafe**	137 (60)
	Place infant on side to sleep with positioning rolls.	33
	Place infant on stomach to sleep	8
	Place infant in most comfortable position to sleep	27
	Place infant on either side or back to sleep	39
	Place infant on side to sleep with positioning rolls and on either side or back to sleep	30
	Do not provide advice at all	32 (14)
	SIDS-safe	62 (26)
	Place infant only on its back to sleep	
Clothing	**SIDS-unsafe**	147 (64)
	Swaddle their infants with extra layers	48
	Use additional hats or blankets	42
	Both advices are common provided	80
	Do not provide advice at all	48 (21)
	SIDS-safe	36 (15)
	Keep room temperature to be comfortable for adult and infant to sleep in light clothing	
Bed sharing	**SIDS-unsafe**	101 (39)
	It's okay to share bed with infant if nowhere else for infant to sleep	6
	It's okay to share bed with infant if convenient to breastfeed at night	22
	It's okay to share bed with infant if concerned about infants' health	13
	It's okay to share bed with infant if it allows mother to bond with infant	23
	It's okay to share bed with an infant for a short period of time	25
	Common provided more than one of these advice (convenient to breastfeed, allows bonding, and if it shared period of time)	41
	Do not provide advice at all	25 (11)
	SIDS-safe	115 (50)
	It is best not to bed share	

Sleep Positions

For the advice provided regarding infant sleep positioning practices, out of the 231 total participants, only 26% (n= 62) provided the SIDS-safe advice regarding infant positing practices and indicated they commonly advise parents that the best practice is to put infants on supine sleep position only. Another 14% (n= 32) never provided any advice regarding infant positioning practices. The majority 6% (n= 137) of participants provided advice that

could heighten the risk of SIDS, such as place infant on side to sleep with positioning rolls, place infant on either side or back to sleep, place infant on stomach to sleep, and/or place infant in most comfortable position to sleep.

Clothing

For the advice provided regarding infant clothing practices, out of the 231 total participants, only 15% (n= 36) provided the SIDS-safe advice regarding infant clothing practices and indicated they commonly advise parents that the best is to keep room temperature comfortable for adults and infants to sleep in light clothing. Another 21% (n= 48) never provided any advice regarding infant clothing practices. The majority 64% (n= 147) of participants provided advice that could heighten the risk of SIDS, such as swaddle their infants with extra layers and/or use additional hats or blankets.

Sharing Sleep Surface

For the advice provided regarding sharing the sleep surface with infants, out of the 231 total participants, only 50% (n= 105) provided the SIDS-safe advice regarding sharing the sleep surface with infants and indicated they commonly advise parents that the best is not to share the sleeping surface with infants. Another 11% (n= 25) participants never provided any advice regarding sharing the sleep surface with infants. Thirty-nine percent of participants (n= 101) provided advice that could heighten the risk of SIDS, such as it's okay to share bed with infant if nowhere else for infant to sleep, it's okay to share bed with infant if convenient to breastfeed at night, it's okay to share bed with infant if concerned about infants' health, it's okay to share bed with infant if it allows mother to bond with infant, and/or it's okay to share bed with an infant for a short period of time.

Bedding Objects Safety

The study also evaluated the advice that participants provided regarding the safety of having objects such as blankets, pillows, sheepskin, bumper pads, stuffed animals, quilts and wedges on infants' beds. The advice was ranked using a five point scale [where1 = do not discuss, 2= safe, 3 = somewhat safe, 4 = no opinion, and 5= unsafe]. See (Table 4.9).

Table 4-9: Frequencies and percentages on advice provided regarding safety of infant bedding objects

Objects	Counts (%) of advice about the safety of objects on infants' bed				
	Do not discuss	**Safe**	**Somewhat safe**	**No opinion**	**Unsafe**
Blankets	37 (16)	95 (41)	80 (35)	14 (6)	5 (2)
Pillows	53 (23)	81 (35)	73 (32)	11 (5)	13 (6)
Quilts	43 (19)	85 (37)	67 (29)	21 (9)	15 (7)
Sheepskins or fleeced	46 (20)	72 (41)	53 (23)	12 (5)	48 (21)
Stuffed animals	46 (21)	21 (9)	71 (32)	9 (4)	81 (35)
Bumper pads	40 (17)	80 (35)	60 (26)	20 (9)	31 (13)
Wedges	41(18)	69 (30)	64 (27)	34 (15)	23 (10)

For using blankets in infant sleep surface, only 2% (n= 5) of total participants provide accurate advice and indicated that they advise parents and caregivers that using blankets is unsafe practice. Another 6% (n= 14) had no opinion and 16% (n= 37) did not discuss this at all. For using pillows in infants sleep surface, only 6% (n= 13) of total participants provided accurate advice and indicated that they advise parents and caregivers that using pillows is unsafe practice. Another 6% (n= 14) had no opinion and 23% (n= 53) did not discuss this at all. For using quilts in infants sleep surface, only 7% (n= 15) of total participants provided accurate advice and indicated that they advise parents and caregivers that using quilts is unsafe practice. Another 9% (n= 21) had no opinion and 19% (n= 43) did not discuss this at all. For using sheepskins or fleeced in infants sleep surface, only 21% (n= 48) of total participants provided accurate advice and indicated that they advise parents and caregivers that using sheepskins or fleeced is unsafe practice. Another 5% (n= 12) had no opinion and 20% (n= 46) did not discuss this at all. For using stuffed animals in infants sleep surface, 35% (n= 81) of total participants provided accurate advice and indicated that they advise parents and caregivers that using stuffed animals is unsafe practice. Another 4% (n= 9) had no opinion and 21% (n= 46) did not discuss this at all. For using pumper pads in infants sleep surface, 13% (n= 31) of total participants provided accurate advice and indicated that they advise parents and caregivers that using pumper pads is unsafe practice. Another 9% (n= 20) had no opinion and 17% (n= 40) did not discuss this at all. For using wedges in infants sleep surface, 10% (n= 23) of total participants provided accurate advice and indicated that they advise parents and caregivers that using wedges is unsafe practice. Another 15% (n= 34) had

no opinion and 18% (n= 41) did not discuss this at all. The following table 4.11 outlines the frequencies and percentages regarding advice given for each type of soft object.

Offering Pacifiers

Advice that participants provided about offering infants pacifiers was also explored. This question used a five point ranking scale [where 1= do not give advice regarding pacifier use, 2 = do not recommend putting the infant to sleep with a pacifier, 3= only recommend a pacifier for infants that will be bottle fed at home, 4 = only recommend a pacifier, once breast feeding is well established, through to 5 = always recommend a pacifier be offered to infants at sleep time]. As the Table 4.10 bellow shows, only a few participants (5%; n= 12) always recommend a pacifier for infants. Forty-two percent (n= 97) either recommended a pacifier once breast feeding is well established or only recommended a pacifier for bottle fed infants. Thirty-one percent (n= 71) of total participants did not recommend offering a pacifier for infants and another 22% (n= 51) who did not give any advice at all regarding pacifier use.

Table 4-10: Advice regarding pacifiers use

Advice provided to parents regarding pacifier use	n	(%)
I always recommend a pacifier be offered to infants at sleep time	12	5
I only recommend a pacifier, once breast feeding is well established	46	20
I only recommend a pacifier for infants who will be bottle fed at home	51	22
I do not give advice regarding pacifier use	51	22
I do not recommend putting the infant to sleep with a pacifier	71	31

4.5 PHASE-ONE FINDING SUMMARY

This section presented quantitative findings from phase-one data collection in the maternal-child units in the hospital. These included the baseline information regarding positioning practices for healthy and medically stable infants in the neonatal units, as well as the knowledge and perception regarding SIDS risks and prevention measures among neonatal healthcare providers, and their parental/family instruction practices regarding the relevant topic. The descriptive analysis for frequencies and percentages of the baseline data collected in the phase-one found a high proportion of infants were placed to sleep in their sides, which is a high SIDS risk sleeping position. The study also found there was high proportion of neonatal healthcare providers caring for pregnant women and infants, with a lack of

knowledge and recognition regarding SIDS risk and prevention recommendations. They also rarely provided parents and families with information regarding SIDS risks or prevention messages.

4.6 PHASE-2: IMPACT OF THE INTERVENTION

- Does the JSEP improve the SIDS-safe infant positioning practices by neonatal healthcare providers in the hospital setting?
- Does the JSEP improve the SIDS knowledge, and ability to access appropriate SIDS resources among a convenience sample of neonatal healthcare providers in Jordan?
- Does the JSEP improve the practical ability to educate families regarding SIDS risks and prevention practices, among convenience sample of neonatal healthcare providers in Jordan?

The researcher targeted a convenience sample of 120 neonatal healthcare providers at KAUH, to pilot the targeted and tailored Jordanian SIDS education package (JSEP). The researcher compared the PRE/POST intervention data for those who exposed to the JSEP, regarding SIDS knowledge and parental/family SIDS instruction practices. The study also evaluated changes in positioning practices for healthy and medically stable infants in neonatal cots at KAUH, following implementation of the JSEP.

4.7 FIRST SURVEY: INFANT SLEEPING POSITIONS FOLLOWING THE INTERVENTION

A repeated cross-sectional visual observation of infant positions in open cots in the neonatal units at the hospital post intervention was conducted to evaluate any changes in infant positioning practices as a result of the education and training. A total of 403 observations were conducted in the pre-intervention and a total of 400 observations were conducted post-intervention. The differences were evaluated using the Chi-square test, as it was the most appropriate test for comparing two independent samples for infants, and comparing two variables SIDS-safe sleep positions and SIDS-unsafe sleep positions. In both pre and post intervention observation sets, none of the infants observed were sleeping in a prone position, this is related to the hospital policy and dominant beliefs among healthcare providers and parents, as discussed in the introduction and literature review.

Table 4-11: Infant sleep positions at KAUH

Infant sleep positions		Pre-intervention N1= 403(%)	Post-intervention N2= 400 (%)	Ch	df	Sig
SIDS-safe	Supine	214 (53)	287 (72)	40.777	1	$p < 0.05$
SIDS-unsafe	Side	189 (47)	113 (28)			

Note: none of the infants observed were sleeping in a prone position.

As shown in the table 4.11, more infants were positioned for sleep in supine post intervention, the recommended SIDS-safe sleeping position (pre: 53%, n_1=214; post: 72%, n_2= 287), while fewer infants were positioned in their sides, the less SIDS-safe side sleeping positions (Pre: 47%, n1= 189; Post: 28%, n2= 113). Chi-square test indicated a significant improvement in the positioning practice in the neonatal units at the hospital setting following the implementation of the JSEP (Chi-square= 40.777; df= 1; $p < 0.05$).

4.8 SECOND SURVEY: THE ISPQ QUESTIONNAIRE RESULTS FOLLOWING TO THE INTERVENTION

As discussed in the methodology chapter for the sample selection process, out of the total convenience sample of 231 neonatal healthcare providers who completed the baseline survey, 120 were targeted to expose to the JSEP and completed the post-intervention survey. The researcher was unable to include all trainees in the JSEP as the training groups had rotation to other places (out of maternal-child health care units). Therefore, only training groups who remaining in the maternal-child healthcare units only included in the post-intervention survey. For validity, the comparison should include participants who were exposed to the intervention and had completed both pre and post intervention questionnaire surveys. Out of the 120, there were 103 identified matched pairs; only seven participants were dropped out the comparison.

Data from pre/post intervention surveys of the modified ISPQ provided matched pairs data for this survey are reported here. The data were analysed to compare changes following the intervention using a non-parametric test (Wilcoxon Matched-Pair Signed-Rank). As discussed in the methodology, this test is appropriate to evaluate changes among one group over period of time with repeated measures and it is suitable to evaluate the median range for

continuous ranked data, where participants are matched (Pallant, 2010). Responses were grouped in a scale, as required for each question.

The result reported depend on Cohen (1988) criteria for this type of data, and guidelines for preparing a research report by Pallant book (2010, p. 232), using *z, r, and p-value*. Standard scores (z) measures the probability of divergence of individual result from the mean. Effect size (r) is used to report the difference between pre/post data. It is a simple measure for quantifying the difference for a defined group of participants and evaluates the growth and strength of a relationship over time on a common scale. Effect size informs the reader of the practical importance of the research findings, investigate the effectiveness of a particular intervention, and it is widely used in the education programs (Schuele & Justice, 2006) Research commonly emphases programs with effect sizes such as those presented by Cohen (1988) for interpreting *r*, such as no relationship= 0.0, small= 0.1, medium= 0.3, and large effects= 0.5 (Cohen, 1988; Schuele & Justice, 2006). Programs with effect sizes above 0.3 are considered to be effective. While the significance level (P-value) can be measured at 0.001, 0.05, or 0.01 levels (Schuele & Justice, 2006), researchers commonly use the significant level of 0.05; therefore, this study used the significant level of 0.05.

As the sample size of the pre/post comparison was 103, which is close to 100. Therefore, percentages and frequencies reported are approximately same. It is recommended to outline either percentages or frequencies to reduce repetition and minimize data confusion.

4.8.1 Demographic profile for participants completed the ISPQ post-intervention

The majority of participants were neonatal healthcare staff (n= 67). The remaining 33 participants were neonatal healthcare trainees. There 93 were females, this reflects the predominance of female nurses in the maternal and neonatal units of the study hospital. There were 50 participants were in the 20 to 25 year old age group, which was the largest group. Followed by the 26 to 30 year old age group (n= 29) and the remainder was over 30 years of age (n= 24). There was 60 participants held a bachelor's degree or higher, while the reminder (n= 43) had an undergraduate diploma. A total of 56 participants were working/training in units caring for neonate infants (NICU, Nursery, Postnatal, and child health clinics) and another 47 participants were working/training in units which cared for pregnant women and childbirth (antenatal, labour, and maternal health clinics). A total of 52 participants had

worked/trained in the targeted units for less than two years, 27worked/trained in the targeted units between two and five years, and the remainder (n= 24) had more than five years experience working in these units. A total of 70 participants usually worked the day shifts; students were most often present in the ward areas during day shifts. The percentages for demographic characteristics of the PRE/POST comparison participants are presented in Table 4.12 bellow.

Table 4-12: Percentages for the demographic profile for participants of the PRE/POST comparison

Variable		**N = 103 (%)**
Capacity of Working/training	Hospital Staff	(67)
	Training Students	(33)
Gender	Male	(10)
	Female	(90)
Age Group	20- 25 years	(49)
	26 -30 years	(28)
	More than 30 years	(23)
Education level	Bachelor or Postgraduate	(58)
	Undergraduate Diploma	(42)
Unit of working/training	Neonatal healthcare units (postnatal, NICU, nursery, & child clinics)	(45)
	Pregnancy & Childbirth healthcare units (antenatal, labour & maternal clinics)	(55)
Period of working/training	Less than 2 years	(51)
	2-5 years	(26)
	More than 5 years	(23)
Most common shifts	Day shift	(69)
	Night shift	(31)

4.8.2 Impact of the intervention on SIDS awareness

The following results present changes on healthcare providers' knowledge and perceptions regarding SIDS risks prevention recommendations. These include knowledge and beliefs about the recommended SIDS-safe sleeping position, and perceptions regarding the relevant safety of each position (supine, side, and prone). In addition, it explored their awareness of SIDS risks prevention recommendations and typical information resources they access for this knowledge. It also explored their understanding of SIDS risks and prevention practices.

Knowledge, Perception and Beliefs about the Recommended SIDS-Safe Sleeping Position

Knowledge of SIDS-Safe Sleeping Position

The study evaluated knowledge regarding SIDS-safe sleeping positions using a three point scale ranked as [1 = inaccurate knowledge (prone or side or both), 2 = mix accurate and inaccurate knowledge (both supine and sides), and 3 = accurate knowledge (supine only)].

As Table 4.13 shows, a Wilcoxon Signed-Rank Test revealed a statistically significant increase in accurate knowledge regarding SIDS-safe sleeping positions following participation in the JSEP: ($z = -5.364$, $p < 0.05$), with a large effect size ($r = -0.53$). The median score on the knowledge scale for both pre and post intervention were (Md= 2) indicating both supine and side as a SIDS-safe position.

Table 4-13: Knowledge regarding SIDS-safe sleep position

	Pre-intervention Md	**Post-intervention Md**	**z**	**r**	**Sig**
Knowledge regarding SIDS-safe sleep position	2	2	-5.364	-0.53	0.000

Beliefs against Using Only Supine Position for Sleeping Infants

The study also explored why some participants recommended using sleeping positions other than supine for healthy or medically stable preterm and full term infants. This is a qualitative question; therefore the Wilcoxon Signed-Rank test was not applicable to use. A descriptive analysis was run to provide percentages evaluating changes in pre-test and post-test beliefs evident in responses to this question (Table 4.14).

Table 4-14: Beliefs against using only supine sleeping position for infants

Reasons for beliefs that it is unsuitable to use only supine positions for healthy/medically stable preterm or full-term infant	**Pre (%)**	**Post (%)**
Increase risk of aspiration	29	20
Cause flat head	14	9
Have more reflux	10	7
Mixed reasons (flat head/aspiration/more reflux)	20	17
Alter quality of sleep/ not optimum for development	15	13
Did not indicate any of the above reasons	12	34

Participants in the pre-intervention survey indicated that they recommended against using the supine position for infant to sleep as the only appropriate position because of their beliefs that this position may increase the risk of aspiration (29%), may cause flat head (14%), and may cause infants to have more reflux (10%). Another group of participants (20%) cited all three of these beliefs as reasons. Fifteen percent believed the supine position might alter quality of sleep and was not optimum for development. In the post-intervention, all these proportions decreased and 34 % of participants did not select any of these reasons, which indicated their beliefs may have changed due to their involvement of the JSEP.

Perceptions Regarding the Relevant Safety of Infant Sleeping Positions

In a similar way, the study reflected changes in perception regarding the relative safety of each position. A five point scale of rank was applied, the ranking scores related to perceptions of safety as [1= the position is very safe, 2 = the position is somewhat safe, 3 = no opinion, 4 = the position is not very safe, through to 5 = the position is not safe at all].

For the prone position, the median range shifted from a pre-intervention perception (M= 4) that it was not very safe to a more accurate post-intervention (Md= 5) recognition that it was not safe at all. The Wilcoxon Signed-Rank Test revealed statistically significant changes ($z = -6.008$, $p < 0.05$, with large effect size $r = -0.59$). For the side position, the median range shifted from a pre-intervention perception (Md = 2) that it was somewhat safe to a more accurate post-intervention (Md= 4) recognition that it was not very safe. The Wilcoxon Signed-Rank Test revealed statistically significant changes ($z = -5.138$, $p < 0.05$, with large effect size $r = -.51$). For the supine sleep position, the median range for perception shifted from a pre-intervention perception (Md= 3) that it was unknown to a more accurate post-intervention (Md= 2) recognition as somewhat safe. The Wilcoxon Signed-Rank Test revealed statistically significant changes ($z = -4.281$, $p < 0.05$, with a medium effect size $r = -0.42$). See Table below.

Table 4-15: Perceived relative safety of sleeping positions

Position	Pre-intervention Md	Post-intervention Md	z	r	Sig
Prone	4	5	-6.008	-0.59	0.000
Side	2	4	-5.138	-0.51	0.000
Supine	3	2	-4.281	-0.42	0.000

Awareness of SIDS Risks Prevention Guidelines

The study examined changes in the participants' awareness about SIDS-prevention recommendations after participation in a tailored SIDS education intervention. This question's answer set was grouped in a three point knowledge scale [1= I do not know about the recommendations, 2 = I have only read, heard, or seen the recommendations, 3 = I am fully aware about these recommendations (heard, read and seen)]. As Table 4.16 shows, the median score on the knowledge scale in pre-intervention (Md= 2) indicated that participants read, heard, or seen the recommendations. This median score significantly increased to (Md= 3) in post-intervention indicating that participants read, heard, and seen these recommendations. The Wilcoxon Signed-Rank Test revealed a statistically significant increase in knowledge about SIDS recommendations after participation in the JSEP ($z = -4.557$, $p < 0.05$), with a large effect size ($r = -0.45$).

Table 4-16: Awareness about SIDS guidelines

	Pre-intervention Md	**Post-intervention Md**	**z**	**r**	**Sig**
Knowledge of SIDS prevention recommendations	2	3	-4.557	-0.45	0.000

Understanding of SIDS Risks and the Relevant Prevention Practices

The study also investigated the impact of the JSEP on participants' perceptions regarding SIDS-risks and prevention measures including infant positioning, bedding, bed sharing, clothing, offering pacifiers, breast feeding and home environment. A five point agreement level rating scale was used [1 = Strongly Agree (SA), 2 = Agree, 3 = neither agree/nor disagree (N), 4 = Disagree (D) and 5 = Strongly Disagree (SD)]. There were six statements, five of them are true and one is false. Changes in agreement with five true statements regarding infant sleep care practices were assessed (see Table 4.17).

Table 4-17: Differences in agreements with True concepts regarding SIDS prevention recommendations

Agreements level with TRUE concepts, n= 103	Groups	Mean	Md	Z	r	Sig
Infants should sleep close to parents, but in a separate space	Pre	2.47	2	-4.402	-0.43	0.000
	Post	1.68	1			
Soft objects (pillows, blankets, and quilts) should be removed from infants' sleeping space	Pre	3.53	4	-3.992	-0.39	0.000
	Post	2.80	3			
Infants should be given a pacifier when they are put to sleep	Pre	3.73	4	-3.382	-0.33	0.001
	Post	3.23	3			
Breastfeeding helps to reduce the risk of SIDS	Pre	2.55	2	-4.09	-0.40	0.000
	Post	1.79	1			
Smoking around infants increases the risk of SIDS	Pre	2.69	2	-3.711	-0.37	0.000
	Post	1.01	2			

Agreements with the first true statement that 'infants should sleep close to parents but in a separate space' increased following involvement in the JSEP, with the median score shifting from pre-intervention (Md = 2) 'agree' towards (Md= 1) 'strongly agree' post-intervention. This was statistically significant change (z = -4.402, p *<0.001,* with medium effect size r = -0.43).

There was less impact on agreement with the second true statement that 'soft objects should be removed from infants' sleeping space' following involvement in the JSEP, with the median score shifting form 'disagree' (Md = 4) pre-intervention, towards 'neutral' (Md= 3) post-intervention. This was statistically significant change (z = -3.992, $p < 0.05$, with medium effect size r = -0.39).

There was less impact on agreement with the third true statement that 'offering a pacifier at bed time to decrease risk of SIDS' following involvement in the JSEP, with the median score shifting from 'disagree' (MD= 4) pre-intervention towards 'neutral' (Md= 3) post-intervention. This was statistically significant change (z =-3.382, $p < 0.05$, with medium effect size r = -0.33).

Agreement with fourth true statement that ‘smoking in the infant’s home environment increases the risk of SIDS’ increased following involvement in the JSEP, with the median score shifting from (M= 2) ‘agree’ pre-intervention towards further agreement (Md= 1) to be mostly ‘strongly agree’ post-intervention. Agreement with both statements was statistically significant ($z = -4.09$, $p < 0.05$, with medium effect size $r = -0.40$).

There was less impact on agreement with the fifth true statement that ‘breastfeeding helps to reduce the risk of SIDS’ following involvement in the JSEP, the median score stayed at level (Md= 2) ‘agree’ for both pre and post intervention surveys, although this was a statistically significant change ($z = -3.771$, $p < 0.05$, with medium effect size $r = -0.37$).

Agreement with the false statement that ‘infants should be clothed so they are warmer than adults’ decreased following involvement in the JSEP, with the median score shifting from (Md= 2) ‘agree’ pre-intervention towards (Md= 3) ‘neutral’ post-intervention. This was a statistically significant change ($z = -5.199$, $p < 0.05$, with large effect size $r = -0.51$). See Table below.

Table 4-18: Differences in agreements with false concept regarding SIDS prevention recommendations

Agreement level with FALSE concept, n=103	**Groups**	**Mean**	**Md**	**Z**	**r**	**Sig**
Infants should be clothed so they are warmer than adults	Pre	2.21	2	-5.199	-0.51	0.000
	Post	3.12	3			

Resources Access for SIDS Information

This study also evaluated the changes regarding the sources that the study participants usually used to access information regarding SIDS risk prevention measures. This question grouped in a four point knowledge scale [1= never access any information resources, 2 = access only one of the available resources journals, meeting speakers, CEP, colleagues, or media, 3= access mix of these resources]. (Table below 4.19)

Table 4-19: Typical resources for SIDS information

	Pre-intervention Md	**Post-intervention Md**	**z**	**r**	**Sig**
Typical resources for SIDS prevention recommendations	2	2	-5.885	-0.58	0.000

The Wilcoxon Signed-Rank Test revealed a statistically significant increase in accessing resources about SIDS recommendations among the participants after participation in the JSEP: ($z = -5.885$, $p < 0.05$), with a large effect size ($r = -0.58$). The median score in pre-intervention (Md = 2) indicated that participants only access one of the available resources including Journals, meeting speakers, CEP, colleagues, or media. This score shifted to (Md= 3) post-intervention, indicating that participants accessed at least a mix of the available resources including Journals, meeting speakers, CEP, colleagues, or media.

4.8.3 Impact of the intervention on parental/family SIDS instruction practices

The following results indicate changes in healthcare providers' practices about educating Jordanian families regarding SIDS risks and prevention recommendations. These included how often SIDS education was provided to families, what advice they provided regarding infant sleep care practices. These included positioning, clothing and sharing sleep surface, bedding objects safety, and providing pacifiers at bedtime.

Frequency that SIDS Education Was Provided to Families

The study explored the changes in participants' practices in educating Jordanian families about SIDS risks and prevention measures, focusing on the advice they provided regarding infant sleeping care practices. A five point rating scale [where 1 = never and 5 = always] used to evaluate how often SIDS education was provided to families in Jordan before after implementation of the JSEP. The difference in the median scores indicated an improvement

in the provision of SIDS education to parents and families following involvement in the JSEP, with median score shifting from (Md= 2) rarely providing SIDS education pre-intervention towards (Md= 3) sometimes providing SID education, post-intervention. This was a statistically significant difference (z= -5.026, p <0.05, with large size effect: r= 0.50). See table below.

4-20: Parental/family SIDS instruction

	Pre-intervention Md	**Post-intervention Md**	**z**	**r**	**Sig**
Often providing SIDS instructions	2	3	-5.026	-0.50	0.000

Advice Provided Regarding Infant Sleep Care Practices.

The study explored changes in SIDS teaching practices of providing the accurate advice about positioning, clothing and bed sharing. The multiple response sets were grouped on a three point rating scale [where 1 = inaccurate advice, 2 = do not give advice, 3 = accurate advice]. See Table below.

Table 4-21: Positioning, clothing and bedding advice

Advice	**Pre-intervention Md**	**Post-intervention Md**	**z**	**r**	**Sig**
Positioning	1	3	-5.458	-0.54	0.000
Clothing	1	3	-4.492	-0.44	0.000
Bed sharing	3	3	-2.876	-0.28	0.004

Positioning

For infant positioning advice, the median range (Md= 1) in the pre-intervention survey, indicated that participants provided inaccurate advice that could increase the risk of SIDS. This score shifted towards (Md= 3) in the post-intervention survey, indicating that participants provided accurate advice to lower SIDS risks following their involvement in the intervention. This was a statistically significant change (z = -5.458, p <0.05, with a large effect size, r = -0.54).

Clothing

For clothing to maintain infant body temperature advice, the median range (Md= 1) in the pre-intervention survey indicated that participants provided inaccurate advice that could increase the risk of SIDS. This score shifted towards (Md= 3) in the post-intervention survey, indicating that participants provided accurate advice to lower SIDS risks following their involvement in the intervention. This was a statistically significant change ($z = -4.492$, $p < 0.05$, with a medium effect size, $r = -0.44$).

Sharing Sleep Surface

For bed sharing advice, the median range did not change pre/post, staying at (Md= 3) for both pre and post intervention surveys, indicating that participants provided the accurate advice to lower SIDS risks. However, this was still a statistically significant change ($z= -2.876$, $p < 0.05$, with a small effect size, $r = -0.28$).

Bedding Objects Safety

The pre/post comparison also evaluated the advice that participants provided regarding the safety of having objects such as blankets, pillows, sheepskin, bumper pads, stuffed animals, quilts and wedges on infants' beds. The advice was ranked using a five point scale [where1 = do not discuss, 2= safe, 3 = somewhat safe, 4 = no opinion, and 5= unsafe].

Following participation in the JSEP, most of the median range scores increased, indicating practices changed to provide more accurate advice regarding the safety of infant bedding objects, such as, blankets, pillows and quilts, staffed animals, bumper pads and wedges. There was less impact on the advice regarding use sheepskin and fleeced, with the median number of participants continuing to regard these as 'somewhat safe' elements; although, the Wilcoxon Signed-Rank Test results revealed a statistically significant changes ($p < 0.05$), with at least a medium effect size ($r > 2.4$) for all elements (see Table 4.22). These results confirmed participation in the JSEP improved provision of accurate advice regarding the safety of infant bedding.

Table 4-22: Advice provided regarding safety of infant bedding objects

Objects	Pre-intervention Md	Post-intervention Md	z	r	Sig
Blankets	2	3	-4.852	-0.48	0.000
Pillows	2	3	-3.034	-0.30	0.002
Quilts	2	3	-4.894	-0.48	0.010
Sheepskins/fleeced	3	3	-2.563	-.25	0.000
Stuffed animals	3	5	-5.296	-0.52	0.000
Bumper pads	2	4	-5.412	-0.53	0.000
Wedges	2	4	-4.901	-0.48	0.000

Offering Pacifiers

The study evaluated the advice that participants provided about offering infants pacifiers. This question used a five point ranking scale [where 1= do not give advice regarding pacifier use, 2 = do not recommend putting the infant to sleep with a pacifier, 3= only recommend a pacifier for infants that will be bottle fed at home, 4 = only recommend a pacifier, once breast feeding is well established, through to 5 = always recommend a pacifier be offered to infants at sleep time].

For advice of offering a pacifier at bedtime, the median range shifted slightly from (Md= 2) 'did not recommend putting the infant to sleep with a pacifier pre-intervention, to (Md= 3) 'only recommend a pacifier for infants that will be bottle fed at home' post-intervention. This was a statistically significant change (z = -3.25, p= 0.05, with a medium effect size, r = -0.32). See table below.

Table 4-23: Changes in the advice provided to parents regarding pacifier use

Advice	Pre-intervention Md	Post-intervention Md	z	r	Sig
Offering pacifiers	2	3	-3.291	-0.32	0.001

4.9 PHASE-TWO SUMMARY

This section presented phase-two findings from the quantitative data of pre/post intervention comparison. These included the changes in infant positioning practices in the neonatal units following the JSEP. The Chi-square test indicated statistically significant differences and an improvement in infant positioning practices to be more SIDS-safe following involvement in the JSEP. Furthermore, this also examined the differences of pre/post intervention ISPQ-questionnaire survey data. A non-parametric test, Wilcoxon Matched-Pair Signed-Rank indicated statistically significant differences and an improvement on neonatal healthcare providers' knowledge of SIDS, resources they access for SIDS information, and it also evaluated changes in their practical ability to educate families regarding the relevant topic, following the JSEP. The next chapter presents the findings of the third-phase, qualitative data describing the study participants' experiences of the JSEP.

4.10 PHASE THREE QUALITATIVE STUDY FINDINGS

- ❑ What are the challenges and future directions for SIDS prevention in Jordan?

This section discusses the qualitative findings of the data collected in the third phase, which explored the neonatal healthcare providers' experience of undertaken the JSEP and their experience of providing the education to families regarding the SIDS-safe sleep care practices.

The qualitative data was obtained from focus groups with a small purposeful sample of 20 neonatal healthcare providers at KAUH, who exposed to the intervention program. Three focus groups were held in March/April at the end of the Jordanian winter. All focus group participants were female, as in Arabian culture maternal; birth and neonatal services are predominantly supported by female staff. The participants' demographics data is presented in the Table 4.24.

Table 4-24: The focus groups participants' demographics

Focus groups	participants	Units of working/training	ages ranged	Working/training experience ranged
FG1 (N= 7)	Three midwives & four maternal-child nurses	Postnatal, nursery, NICU, and paediatric clinics	24-40	1- 12 years
FG2 (N= 7)	Three midwives & four maternal-child nurses	Maternal clinics, antenatal, and Labour	22-38	1- 9 years
FG3 (N= 6)	Nursing students	Have training in all maternal-child healthcare units	21-26	3-18 months

Main Themes Findings

Three main themes emerged from the qualitative data analysis, as summarised in the figure below.

4-4: Main themes

4.10.1 Theme 1: Impact of implementing the SIDS education package in Jordan

This theme is about reaction of the neonatal healthcare providers to the newly implemented JSEP and its impact on their knowledge, beliefs and practices regarding SIDS prevention risks. It also indicated changes on neonatal healthcare providers' ability to educate other staff and students as well as share this knowledge with families in workplace and in their homes and within the surrounding community

Feedback about the Program

Participants gave overwhelmingly positive feedback about their involvement in the JSEP: "We found this subject important, the education package very helpful" (FG1). Another said: "really we have found this experience is effective" (FG1). The program empowered them to change and adopt improved SIDS-safe practices. "The effectiveness of the project was in stimulating us [participants] to take action to prevent SIDS … sometimes important advice may make big changes" (FG2). Participants believed they had acquired new, important information, and that the SEP motivated healthcare providers to put this knowledge into the practice.

They were also excited about the implementation of the project and affirmed the value of the PAR. One focus group participant stated: "I like the idea of running a project like this, and the way of running it was exciting . . . it was a new activity, we like the way this program has been implemented. It was very effective and appropriate." Another said: "the difference that this project has made is just amazing. The change has happened in a comprehensive, harmonious way" (FG2).

During the first survey, participants commented they had difficulty answering some of the pre-test questions (ISPQ) and checked their answers with one another and with other medical personnel in the hospital, such as paediatrics and maternal physicians and specialist. During the preliminary stage of the project, the participants felt encouraged to seek information on SIDS in books and on the internet. The ISPQ survey motivated those to study the SIDS posters that were displayed on the walls of all maternal-child healthcare units once the hospital began implementing the SEP:

> ... we started to see new posters everywhere on the hospital walls. We found what we had been missing; the thing which we were looking for . . . everybody was encouraged to have a closer look and to learn the right information on SIDS prevention (FG2).

Participants commented on the pamphlets and educational material containing useful information about SIDS, risk factors and prevention guidelines were distributed to the staff counters in the hospitals. "We went to the counter and found an education paper and pamphlets in both Arabic and English language. We were glad to have a look" (FG2). Participants also commented on the appeal of the workshops offering more details about the

theory of SIDS, risk factors and the role of healthcare providers in SIDS prevention. “We were inquisitive and enthusiastic to see what this workshop would be like” (FG2). Those who attended the workshops liked the idea that they were obtaining the information first-hand.

The training groups at KAUH found small group sessions at the hospital were useful, as they were able to discuss numerous issues and ask questions: “we were grateful and glad to participate in such hospital activity. In this project, we attended the session with other KAUH staff. We sat with them and discussed combined activities” (FG3). The training groups discussed their reactions to various education programs, and endorsed the PAR approach characterising the SEP:

> The difference between this project [SEP] and previous ones [general health education] that we have been involved in, is that we participated in each component of the project . . . It is comprehensive; it is not just a class and then finished. The difference between this project and previous ones is that we participated along with hospital staff in the same activity. They did not provide a university class to obtain the knowledge to pass our exam . . . We felt we were important and others felt the same. It was useful. (FG3).

Another participant commented:

> I like the topic [SIDS] and we all derive the benefits. The interesting thing about this project is that we were all feeling like we were staff and had a role in developing this initiative. It was the first time we felt that we were important and had an opinion, while we were still students. (FG3).

Participants found these discussion meetings that ran in each ward during follow-up implementation of the SEP to monitor and progress the change in practices were very effective for sharing ideas and getting up-to-date information. Neonatal nurses and midwives were even planning to continue running discussion meetings as an impetus for ongoing improvements in healthcare practices. They described the discussion meetings as an effective strategy for enhancing healthcare providers, knowledge and practice:

> Staff like discussion meetings which is not available in other hospitals. There were no difficulties in providing a 20-minute discussion for staff, which provided benefits and enhanced staff knowledge and practices. It also improved our critical thinking and creativity (FG2); . . . Discussed some articles on SIDS and some on the nursing role in reducing SIDS risks. We never felt like we wandered away from this topic or desisted from it (FG3).

The training students indicated the hospital staff were concerned about SIDS, the staff continued to support the education package and encouraged the students to teach and inform parents and caregivers about SIDS. One participant said: “I remember the head nurse in NICU at KAUH provided us [training students] with pamphlets and she recommended sharing them. As she said to me: ‘please provide a copy to anybody you feel may be interested in knowing about this topic [SIDS]” (FG3).

Focus group discussions praised the volunteer trainers for playing an important role in the implementation of the SEP and they acknowledge the JUST Master of nursing program for supportive activities in SIDS education:

> Masters students at JUST have been helping us [hospital staff] in presenting the SIDS education sessions and presenting academic articles for the staff, as part of their study program is to run some education classes to healthcare providers, patients and families as well as develop suitable audiovisual materials . . . they have done a great job (FG2).

The SEP introduced a more dynamic and interesting component to clinical training for nursing students. Nursing students undertook extensive activities related to SIDS education on their clinical days, causing one participant to comment: “I felt the days of clinical practice were changing from the norm” (FG3).

Improving of Healthcare Providers’ Behaviour to Educate Families Regarding SIDS

The focus group participants reported their involvement with the JSEP had improved their behaviour to provide the SIDS prevention advice to families. Their knowledge of SIDS has been improved, resulting in an increase in their confidence and ability to provide the SIDS prevention advice. They reported that they had started to play their roles as healthcare educators to parents, their families, and other child caregivers, much more effectively. Neonatal healthcare providers delivered the SIDS prevention advice during their work duties in the healthcare settings, as well as during their daily life in their homes and surrounding community. These summarised in the Figure 4.5.

4-5**: Project impact on healthcare providers' roles to reduce SIDS risks in Jordan**

SIDS Knowledge and Parental Education Practices Prior to the JSEP

Focus group participants indicated that before they involved in the JSEP, they knew very little about SIDS, the risk factors and prevention strategies. "Previously, we did not have enough knowledge on this field and we could not provide appropriate instruction for parents. This subject was new for us… nurses themselves do not know about SIDS" (FG1). Nursing students also indicated their clinical training provided them with scant and superficial information about SIDS. "We just knew the definition of SIDS, but we did not know what the high-risk practices were" (FG3).

Participants indicated that prior to participating in the project they and other hospital neonatal healthcare providers had not felt responsible for highlighting the risks of SIDS and had lacked the knowledge and confidence to provide the correct advice regarding SIDS. Prior to the SIDS prevention program, participants only provided parents with general education on infant health and did not provide SIDS-education: "We did not deliver any information regarding SIDS prevention during infant hospitalisation or even at discharge. We never discussed any issues regarding SIDS prevention" (FG1) one participant declared. Another stated: "we did not alert parents to SIDS risk factors before implementing this education package [JSEP]; and were never provided with instruction on SIDS" (FG2). And another: "before the program we never gave advice regarding SIDS prevention" (FG3).

It is clear from these comments that neonatal healthcare providers at KAUH did not focus on SIDS education, either during hospitalisation or at the time of the infant's discharge. Participants affirmed that the infant discharge teaching plan at KAUH did not included SIDS

education. It is covered hygiene, feeding and bathing, as well as specific treatments and medication as required, and was designed to answer general questions related to feeding, sleeping hours, child growth and development. Furthermore, parents appeared unaware of SIDS. One participant declared; “Parents rarely asked about SIDS because they were unaware of the condition” (FG1).

Conflicting Issues with SIDS Prevention Practices at the Start of the Project

Participants indicated that at the start of the project, they had some confusion regarding certain recommended SIDS prevention messages and practices, such as using only supine positions to sleep. Participants indicated their practices were not SIDS-safe prior to SIDS education, and focus group discussions exposed some risky beliefs and practices. For example, in the nursery unit, staff placed infants on their side after feeding, regardless of whether the infant would sleep or not, because they believed it was the best position to prevent suffocation from vomiting. Staff also used the same practices in their own homes and recommended these practices to others. Concerns about suffocation risks for colicky infants meant that:

> In winter infants may have much colic, so we and parents try to keep them on their side most of the time. We were confused about regurgitation of the milk or vomiting to cause suffocation if the baby lies on its back (FG2).

Like many parents in Jordan, participants also believed the supine sleeping position gave infants a “flat head” and to prevent this, it was necessary to regularly change the infants sleeping position. One participant said: “parents think during the first few months of life, infants should be placed in a variety of positions (both sides and back) to prevent flat head and some staff think so too” (FG1). Focus group participants did not know that sleeping on their side could cause sudden death in infants. Staff believed that the prone position was the riskiest. Such practices were passed on within their communities and staff tended to follow the same practices in their own homes.

Like other Jordanians, some participants believed that infants needed to be on their side after feeding to prevent suffocation from vomiting, and also believed that having infants sleeping only on a supine position:

> . . . may increase the chance of suffocation because gravity may prevent the vomit from getting out. It will stay in the throat and constrict the infant's airways causing suffocation and death. Some nurses put infants on their sides after feeding regardless of whether the infant will sleep or not, to prevent suffocation from vomiting or regurgitating milk . . . and also follow the same practice with their babies at home (FG1).

Issues had raised regarding offering infants pacifiers at bedtime. Participants indicated that at the start of the project, giving the infant a pacifier was the most contentious issue for them, as they felt conflicted about its purpose and did not believe that pacifiers prevented SIDS. Staff regarded pacifiers as a tool to promote the sucking reflex of premature babies, and believed that giving pacifiers to infants after feeding could cause death from suffocation. They believed this risk was heightened if the infant vomited or retained sufficient milk in its throat to constrict its airways.

Pacifiers and other infant care equipment such as milk bottles, milk formula, containers, glasses, and thermometers were included in the KAUH gift pack to parents of newborn infants at infant discharge. Staff did not, however, encourage parents to make general use of these pacifiers, as they were unaware that offering pacifiers could reduce the risks of SIDS.

Improving of SIDS Knowledge, Confidence and Skills to Provide the Accurate Advice

All focus group participants indicated their knowledge about SIDS had increased after the JSEP and that it had made them more aware of SIDS risk factors and prevention practices, such as safe sleeping practices, SIDS-safe home environment, giving infants a pacifier at sleep time and encouraging breastfeeding. After implementation of the JSEP, participants felt more confident about providing the correct and essential advice to parents and caregivers on SIDS-prevention practices, demonstrating the safe sleeping position and explaining what is required to make a SIDS-safe sleeping environment. They were also aware of the importance of delivering SIDS prevention messages and demonstrating SIDS-safe practices to parents and caregivers: "We get new knowledge . . . we are now more knowledgeable on this topic and we now know what SIDS is. We know what our role looks like" (FG3). One participant said: "we know how much this [SIDS prevention practices] can help in SIDS prevention" (FG2).

After implementation of the JSEP, participants played a more active role in SIDS prevention. They indicated the program had changed their opinions, and they now understood their responsibility to provide advice to parents and caregivers about SIDS prevention:

> I have changed so much. It is a change in our minds and our way of thinking, our role has changed. We have learned how to improve our practice and thinking to provide better healthcare services (FG3).Our role in preventing SIDS has changed. Now we feel more confident. It surprised me how interested we were in the new knowledge . . . I was interested in the new knowledge (FG1).

Neonatal healthcare trainees felt more responsible after participating in the SIDS education project and saw a necessary role for themselves in the healthcare process. Neonatal healthcare trainees also had more positive attitudes towards educating parents, their families and other child caregivers; they also felt their opinion was important and valued:

> We felt we are important and others observed that as well. As a part of our clinical training I discovered that we have an important role in this. Really, we were neglectful in the past. Neonatal healthcare it is more comprehensive and superior (FG3).

After implementation of the JSEP, participants described a change in their practice: “our role in preventing SIDS has changed positively” (FG1, FG2, FG3). They delivered SIDS prevention messages and played the role of educators at every opportunity. Participants used correct practices to prevent SIDS, both in the hospital and in their own homes. They also indicated that hospital staff who had participated in the JSEP, discussed SIDS prevention messages with each other, and encouraged the delivery and practise of prevention measures. Neonatal healthcare staff encouraged neonatal healthcare trainees to communicate these messages, and they shared their new knowledge with other healthcare providers at KAUH and other neonatal healthcare providers from other health institutes. Neonatal healthcare trainees participated in the JSEP also shared this information with other colleagues and teachers, who had not yet participated in the JSEP:

> We share this knowledge [SIDS-prevention advice] with our university colleagues and teachers. We also shared the new knowledge with our colleagues who are training in different hospitals . . . I have a friend in a Science College and I have shared this knowledge with her and she also spread the knowledge to others around her (FG3).

Participants also reported positive changes in infant discharge teaching plans at KAUH. Staff suggestions were being incorporated and the teaching plan was started early so that SIDS prevention education could begin well before discharge. Amongst other things, instruction to parents included the importance of placing their infants on their back, and staff at the NICU unit also provided parents with a written instruction guide which they discussed once the infant's condition had stabilised.

All focus group participants indicated that since taking part in the project, they had actively communicated their new found knowledge to their surrounding communities. One participant said: "I have delivered these messages to our relatives, neighbours and friends who have infants" (FG2), and another: "every new useful thing I learned, I shared with people who I know or who ask a question" (FG3). Participants also used different methods of providing this information to community members. Some provided verbal advice and supplemented it with written educational material such as pamphlets and posters. Others adopted the approach of posting messages on their Face-book wall to spread the knowledge to the public. Their enthusiasm was summed up by one focus group participant who said:

> Now, I am trying to play my role as an educator by teaching mums, dads, our neighbours, relatives and the community surrounding me. Now, I am sure that we who learned this topic, all provide the right advice to mums for safe infant sleep practices . . . Right now I try to play my role as educator wherever I can, even with pregnant mums, new mums, or multipara mum [women who has given birth to more than one viable foetus or living child] and usually I provide a copy of our pamphlets (FG3).

Participants also gave examples of how they shared their knowledge of SIDS with others in their community. One said: "I gave this advice to my sister who gave birth to twin boys and to her husband. I also teach my second sister who is pregnant now" (FG1). Another participant stated: "My sister had a new baby last week and I taught her and her husband about this topic and they liked this information and they told me that this is new knowledge for them" (FG2). And: "when I received this SIDS prevention advice at the hospital, I went to my home that day and informed my family of what I had learned" (FG3). Another said:

> I went to visit a relative mum, who has a newborn baby. I saw the mum put her infant to sleep with a heavy dressing, use many quilts and put sheepskin under him to make sure he is warm. Moreover, the kerosene heater was in the room close to the infant, the windows and the doors were closed and there were lots of visitors sitting in the same room. I advised her on what I have learned in the workshop regarding infant care practices. I advised her

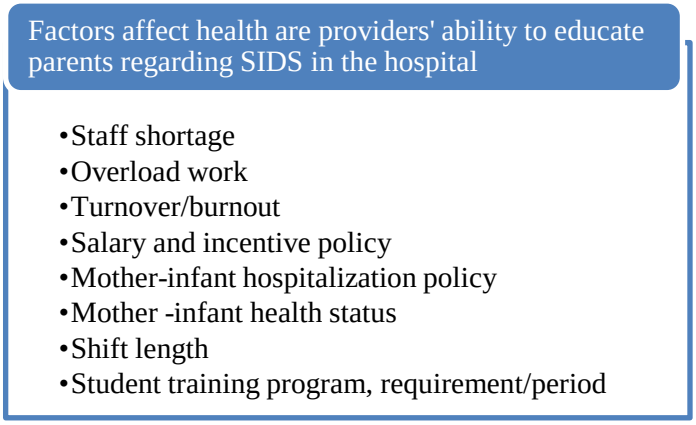
> not to use a heavy cover for her baby as it is a risk for SIDS, and I taught her what SIDS means, the physiology and theory of SIDS, risk factors and prevention practices. She also asked me to provide her with a copy of educational materials to keep and I brought a pamphlet with me and she read it through. I advised her to remove the toys from the bed, put the infant in the middle of the bed and not to overheat him; she should put him to sleep with a light quilt and light clothes, and should also keep the room well ventilated by opening at least a window regularly, so the air could refresh and increase the oxygenation inside the home (FG3).

4.10.2 Theme 2: Challenges to SIDS education in Jordan

Challenges were one of the major themes that emerged from the qualitative data analysis, and the focus group participants subsequently endorsed the use of "challenges" as a distinctive theme. These challenges related to the hospital setting and Jordanian community and population characteristics.

Challenges to SIDS Education in a Hospital Setting

Numerous challenges emerged during the implementation of the SEP in the hospital setting in Jordan. These affected health care providers' roles in preventing SIDS by educating families and related to mother/infant health status, mother/infant hospitalisation policies, hospital working/training policies, hospital salary and incentives policies, staff shortages, shift lengths, work overloads, mother/infant health status, staff turnover and burnout, student training program requirements and schedules. The other challenges related to family circumstances and population characteristics, such as culture, traditions, socio-economic factors, educational background, age group/gender, home environment and climate (Figure 4.6).



4-6: Challenges for SIDS education in the hospital setting

Focus group discussions with nurses and midwives focused on the key issues affecting their ability to provide SIDS education to parents and caregivers. There is a short window of opportunity for hospital staff to meet parents and discuss essential topics about mother and infant care: “mums do not stay a long time after the delivery” (FG1). This window is considerably reduced when the hospitals’ many students are undertaken their mid-semester clinical exams: “Providing families education group during this period [clinical exams] is hard” (FG1).

Participants also reported that most of the childbirth and neonatal units at KAUH experienced staff shortages and high workloads; with the result that they had very limited time to provide SIDS instruction to parents. The workload at KAUH hampered their efforts to provide parents with as much instruction as they could: “In the last couple of years the workload at KAUH has increased significantly; an incredible number of clients and you know mothers prefer here [KAUH] because of the reputation of the hospital” *(*FG1). The antenatal unit accommodates women with high-risk pregnancies. Staff reported difficulty in providing SIDS education to women diagnosed as high-risk pregnancies. These women were often anxious and frustrated at their long hospitalisation and therefore are often not receptive to advice and instruction on SIDS. Students indicated they had difficulty providing pregnant women with SIDS education, during their training in the antenatal unit. One participant explained:

> Mothers with high-risk pregnancies are not usually given any education on SIDS, because her concerns are mainly about her own condition. Instructions are generally provided on preventing complications from her disease. Sometimes women have a high-risk status and feel bored in hospital (FG3).

Woman with high risk pregnancy, such as placental abnormalities, stays long hospitalised under constant supervision, and remains for follow-p in the hospital until after delivery. Contact with high-risk pregnant woman is restricted and nursing students are not recommended into her room because of her situation and mood. One participant said: “I have seen pregnant women, who were anxious to stay at hospital; pregnant women diagnosed with placental abnormalities, such as Previa or Abruptio were alone and very nervous” (FG2). One participant explained: “all her [woman with high-risk pregnancies] consideration at the moment is for herself and the health of her foetus” (FG2).

Labour unit staff played a role in preventing SIDS by encouraging breastfeeding. These staff also arranged to provide the relevant SIDS instruction on the postnatal ward, rather than within the labour units:

> It is very hard to get a chance to talk to parents on the birth day . . . It is very hard to provide instructions about SIDS prevention in the labour unit, but in the postnatal unit we contact mother, father, their relatives and friends. We communicate with them; we get the chance to provide instruction on postnatal and infant care, and include SIDS prevention messages (FG3).

In the postnatal unit, many demanding issues constantly compete for staff time and attention, especially where mothers have had a complicated labour or the infants have medical problems. As new mothers have questions about postnatal and neonatal care practices, staff provided instructions and advice that covers most frequently asks questions. Postnatal staff indicated that while SIDS education is important, there are more pressing topics that need to be discussed during the 6-24 hours prior the discharge. Participants felt frustrated by the lack of time and opportunity to educate mothers: "with the little time that mothers stayed in the unit and with work overload, the staff could not cover instruction for each topic and certainly could not provide adequate time for each one" (FG2). As discussed before, mothers do not stay for long after birth and in the labour units and staff transfer them immediately to the postnatal ward for postnatal care:

> After birth mothers feel tired. She tries to sleep as soon as she moved to the postnatal unit and of course, we cannot interrupt her. When mum become stable and able to talk, we already have finished our training hours and when we come back on the following day, the mother has already been discharged or is preparing to be discharged. (FG3).

At the time of discharge, the parents with medically unstable infants were often anxious and stressed about their infants' medical condition, and it was not an appropriate time to discuss the issue. Staff reported feeling compelled to ignore SIDS education because they do not want increase their stress. In favour of advising parents about specific treatments and medication for their infants as documented in the Infant Discharge Teaching Plan:

> When parents have a newborn baby with medical problems, we [training students] cannot stay with them and provide SIDS education until the baby becomes well and stabilises. In high-risk cases, we cannot provide education to parents, as their mood is just bad due to their difficult situation. Parents and their family are feeling sadness at such times,

> especially when the mum is discharged while her baby is admitted for follow-up or observation (FG3).

In neonatal nurseries, the number of infant admissions sometimes reaches twenty a day. These infants remain in the nursery for an average of between 12 and 24 hours, and a maximum of 36 hours in high-risk cases. Despite a ratio between staff and infants is one to six, staff in these units are expected to keep up with new admissions and discharges. This imbalance limits the opportunity for staff to meet with parents and makes it extremely difficult for nursing staff to provide effective SIDS education. Any SIDS education delivered in the unit is more likely to take the form of brief messages rather than demonstrations.

Staff in the maternity clinics at KAUH ascribed the difficulty of providing SIDS education to women presented there. Women who attend the hospital maternity clinics often have health issues that are not pregnancy-related, such as high-risk or complicated conditions caused by a disease or serious medical history. These women require follow-up appointments that usually include tests and other medical procedures. As the primary medical complaint and relevant care is the priority concern in such instances, nursing staff can do little to provide SIDS education, beyond alerting pregnant mothers, their families and friends, to the SIDS posters on the clinic's walls.

KAUH is located far from the city centre, patients attending the KAUH maternity clinic need to organise transport to get to the hospital. The KAUH clinics also require women to register for their appointments, a time-consuming process due to the large numbers who attend the clinic daily. Staff reported that women attending these clinics are usually pressed for time and go home immediately after their doctor's appointments. Coupled with the time pressures confronting staff, all these factors significantly reduce the opportunities to provide families with information and advice on SIDS.

Similar concerns prevailed in the paediatric clinic at KAUH, where children of varying ages are treated for a variety of complaints. As the priority is to provide care and instructions for the primary illness, staff in the paediatric clinics confine their SIDS education efforts to alerting parents to the SIDS posters:

> Our child patients are from all ages, not just infants or newborns, and we cannot focus on one topic and ignore others. Parents should have access to

> this information [SIDS education] in postnatal and nursery units. Reviewing the posters here in the paediatric clinics can keep them alerted to the SIDS risks (FG1).

In NICU, workload and time constraints are the main limitations, reflecting the large number of admissions. As medical rounds take place during the morning shift and students and volunteer staff trainers usually finish work in the afternoons at the end of visiting hours, it is difficult for staff to provide instruction during either of these shifts. There is likewise little opportunity for SIDS education during the night shift, which is covered by fewer staff. Staff who attempted to provide a regular SIDS education class for parents in a seminar room within the NICU found:

> . . . they [parents] interacted with us [NICU staff] and asked questions. Still, it is hard to run the same activity regularly . . . Sometimes it was hard for NICU staff to provide parents with SIDS education (FG1); . . . now we try to provide as much instruction for parents as we can. However it is still superficial and limited, due to the team shortage (FG2).

Staff shortage is the most common problem associated with an inability to provide SIDS education and was mentioned by most of the hospital staff interviewed: “staff shortages and work overload are the main barriers” (FG2). As focus group participants explained, the staff to infant ratio at NICU is a major drawback for promoting SIDS education:

> . . . at NICU the staff-infant ratio is usually one to five. However, the best ratio should be one to one, which is more significant for providing better care and enabling the nurse to instruct the parents at the same time. In Al-Khialege, hospitals have a different system; at NICU the ratio is one to one (FG1).

Participants reported that a number of their colleagues had left their jobs due to “burnout and turnover” and dissatisfaction with the hospital’s incentives. For them, although “it [KAUH] is the best hospital in there, the salary is not good enough” (FG2). Early in 2012, the Jordanian Nursing and Midwifery Union called upon all nurses and midwives in the health sector in Jordan to strike against unsatisfactory working conditions. One participant said: “nowadays nurses and midwives set-in, as they are not satisfied with their career incentives” (FG2). Staff with two or more years experience were frequently offered work outside Jordan, and were motivated to move by both a significant salary increase and improved standard of living:

> I need to move and look for a better offer. I've got a master's degree and around 12 years experience; however the salary is not good enough ...We hope to leave and find a better offer or even stay at home (FG2).

Many were looking to move outside Jordan to work in Al-Khialege countries (Arab oil countries), where they would get a significant salary increase for a less demanding workload:

> There are huge numbers of health professionals leaving their jobs in Jordan and especially here at KAUH where there is too much work and fewer healthcare staff. Sure, in Emirates you can get a better job with much more salary (FG2).

One participant said: "around 30 staff left the hospital last summer. This year, five staff left the labour unit". At NICU, only two staff remained from the group that commenced in 2004. As a result, the hospital has had to run staff education programs and training at least every two years to recruit new staff. Staff shortages are pervasive in the hospital system and stem predominantly from short-term periods of employment - no sooner have new recruits completed their training and acquired experience, than they moved on to another unit or left the hospital altogether. This issue will need to be addressed by the government in order to ensure a future supply of nurses for the growing population.

Hospital staff acknowledged the benefits of having trainee students in the healthcare services, even though trainees were unable to interact much with staff or patients: "Trainee students help us [the staff] in the nursing care unit and they run a useful activity and presentation, but they still have a fixed study program and they have to follow it, to balance between clinical and theory courses" (FG1). Hospital staff also discussed the vital role of healthcare trainees in educating parents and supporting SIDS education during their training:

> The healthcare trainees, help staff in providing the education class for parents and providing the care as well, which helps to decrease the workload, but they have fewer shifts per week and when they finish the training period and get the experience, they leave. So, always we found ourselves needing to start training again for new training groups (FG1).

The focus group made the point that there are large numbers of unemployed neonatal healthcare professional in Jordan, such as nurses and midwives:

> Qualified neonatal healthcare professionals, such as nurses and midwives remain unemployed and stay at home because they are unable to find jobs. Despite the evident shortage of staff in hospitals, there is little support from the government to provide qualified nurses and midwives with a career in the health sector. (FG1)

Discussions with the neonatal healthcare trainees highlighted challenges they faced during their clinical training within the hospital when attempting to provide SIDS education to parents and caregivers. The key challenges were their limited training time, extensive university study requirements, and an imbalance between their clinical training and theoretical requirements of the course. The hospital clinical training involves tasks, which took much longer than the allocated time and appeared unrelated to actual job requirements. Furthermore, at the end of each clinical day student were required to complete a SOPIE[1]:

> The clinical training day ends around 1:30 pm and the last hour are to attend the clinical conference. Trainees have a 30-minute breakfast break, so actually time for trainees to be spent in the unit is around four hours. So, the time is very short to have any conversation with parents and there were many topics needed to be covered, as well. Maybe we can finish the SOPIE during this time, maybe not. Actually, the SOPIE means to put your health planning, implement and evaluate it. For us it is unreal, what we write on the paper, is not what we actually do, as it is (mere ink on paper). We can't implement what we plan and of this we also don't evaluate that, as there is no time to do so. The clinical grad evaluates your writing of the SOPIE, which is unfair and it is like deception. Actually, we haven't the time to implement any one of the objectives that have been written in our SOPIE... it's just a very hard (FG3).

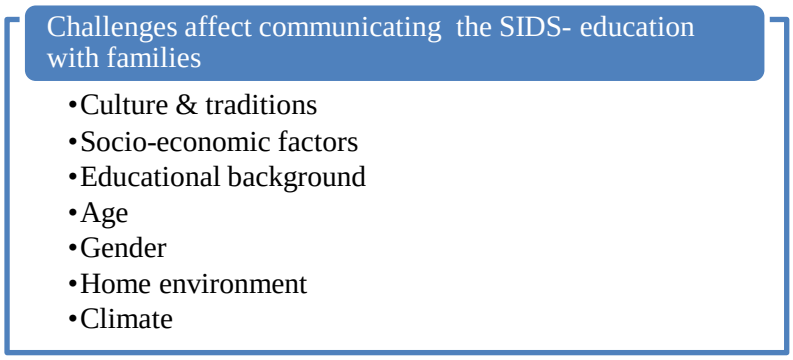
Clinical training requirements are another issue with healthcare trainees from nursing and midwifery school. As they required registering for both theoretical and clinical courses simultaneously, in addition to prescribed courses in other schools. Healthcare trainees indicated they were bored with the clinical training at hospitals because it involved a lot of non-clinical work: "clinical training course in the hospitals for nursing students cares more about the theory than the clinical practice" (FG3). As clinical nursing training system for bachelor nursing emphasised theoretical exams rather than hands-on clinical practice, they did not engage with parents or provide much advice during their hospital training. Healthcare trainees also indicated parents trusted experienced healthcare providers or trainees who had more hands-on clinical practice. One nursing student said:

> Sometimes we feel the parents trust the healthcare trainees, who had more hands-on clinical. Parents are right to do so, because we all enter the patient's room with a SOPIE in our hand and just do writing. Trainees are always running through the corridors and just checking the SOPIE (FG3).

[1] SOPIE is an evaluation criterion for students in clinical training but is not essential to implement in practice. The acronym means: S = Subject, O = Objective, P = Planning, I = Intervention, E = Evaluation.

Impact of Jordanian Community and Population Characteristics on SIDS Eduction

This study revealed that Jordanian culture, traditions, socioeconomic factors, education background, age group and gender as well as climate and home environment impacted on implementing the SEP in Jordan. These factors impacted on both families' receptiveness to SIDS-prevention messages and healthcare providers' ability to educate families (Figure 4.7).



4-7: Challenges to communicate SIDS prevention messages to families in Jordan

Participants acknowledged that infant care practices in Jordan were steeped in tradition and were therefore hard to change. Opportunities for hospital staff to meet with mothers after birth and provide SIDS education are limited because women in Jordan see delivery as a normal event and prefer to return home as soon as possible after giving birth. A participant, who was also a mother, said:

> I am a knowledgeable person, I asked the doctor to speed up the discharge for me. You don't know how much we mums face, who ask for speedy discharge process, they do not like to stay in hospital for long. I remember one of them very well . . . She had a high-risk delivery, had pre-eclampsia with severe hypertension and she tried to fly (FG2).

Focus group participants indicated cultural challenges sometimes prevented SIDS prevention messages from getting through. Culture and education also appeared to influence health advice:

> Sometimes, families have knowledge and beliefs opposite to those of nurses... you may face a difficult situation that limits your ability to spread your knowledge or even practices it as part of your work role or even in your natural life (FG2).

Parents' and caregivers' cultural beliefs, socio-economic status, education level, age group and gender impacted on their receptiveness to SIDS-prevention advice. The advice mothers receive from the surrounding community affects their attitude towards infant care. One participant explained:

> Grandmothers and sisters, also female relatives and friends, all can provide a variety of recommendations depending on their experience and lacked scientific credibility. We know that most of these recommendations are true; however, there are some myths (FG2).

There was considerable resistance to some SIDS-prevention advice, such as offering infants a pacifier at bedtime. Some parents accept this idea [offering a pacifier] and some never care, as they think is not an important issue (FG1), other parents believed: "it has negative effects on teeth structure (FG2). Staff shared parents' concerns that pacifiers would become a difficult habit to change when the infant grew older, and associated them with certain health problems. "We [staff] have the same beliefs as parents. We both hate pacifiers . . . parents think it [pacifier] can cause recurring throat infections and gastrointestinal infections" (FG1).

Parents' education level influenced their ability to understand and apply new knowledge. Parents with higher levels of education were reportedly more receptive to SIDS education than parents with lower education levels. The more educated parents also showed more ability in following and accepting SIDS prevention advice, and more willingness to put it into practice. "It was apparent that when mum had a high educational level, she was more able to follow instructions and it was easier for you [health professional] to provide her with an education" (FG2). Participants explained that better educated mothers could also more easily access information from a variety of different resources such as the internet, books and journals. Even women with low levels of education were, however, able to obtain SIDS prevention advice by reading the posters on the walls of their hospital wards. Those who were unable to read received a verbal, face-to-face education from healthcare professionals.
In view of the obvious time and resource constraints, the hospital's healthcare professionals could not guarantee SIDS education had been provided to each and every parent that visited their hospital. It is, however, clear from the findings, that parents' level of education challenges nurses to use their limited time to best effect:

> There were still some challenges in relation to education levels. It specifies the way that we provide the knowledge, so it depends on how knowledgeable the parents are. Mainly highly educated parents have been alerted to review the posters, and we usually provide them with written education material. People with lower education levels need more attention and we [the staff] may need to spend more time with them. This is difficult for us [the staff] as the time is so short (FG1).

Socio-economic factors were also identified as posing challenges for effective SIDS education in Jordan. Families from the upper class and sometimes from the middle class appeared to grasp the SIDS- prevention messages more easily. Unfortunately, parents with a lower socioeconomic status are usually both less educated and most at risk from SIDS. Families with lower socioeconomic status lack awareness of SIDS and their social and economic circumstances make it difficult for them to adopt SIDS safe infant care practices. A staff member commented:

> We all know how much economic status can affect infant care practice. Parents from a lower socioeconomic level usually have less education but even so, they usually accept our instruction. They have the knowledge and sometimes they change their attitudes, but they still practise unsafe infant care due to their social and economic circumstances. We have to excuse them, we cannot convince them, as their situation is hard, they have not enough sources to provide good quality infant care (FG1).

Participants saw economic status as linked to several SIDS risk factors. Many families cannot afford SIDS safe-bedding or SIDS-safe environment and use inexpensive, readily available sources of heat such as gas, kerosene, charcoal and wood heating in their poorly ventilated homes. Even middle class parents therefore rely on layers of clothing and multiple swaddling layers to keep their infants warm:

> Cost of living is now very expensive in Jordan, everything is increasing. The oil and electricity is in very great demand and very expensive. Families in Jordan adapted with winter reality using cheap ways . . . to keep infants warm use hats, heavy quilts, multiple swaddling layers and layers of clothing, and a sheepskin is placed under them for additional warmth... using gas, kerosene and more dangerously wood, can cause sudden infant death from suffocation (FG1).

Participants reported the recommendation to put infants to sleep in light clothing was likely to provoke the most resistance as it constituted such an extreme departure from the normal Jordanian practices. Mothers were expected to oppose this practice on the grounds that a loss

of body heat could damage their infants' health. Even the nurses and midwives appeared conflicted about delivering SIDS-prevention advice that required such a drastic break with tradition. Health professionals, who advised parents about SIDS safe practices often, felt they were making unrealistic demands, especially for less wealthy families:

> We all encourage parents to change their practices but feel inside ourselves that it is just hard. Our recommendation for SIDS prevention is 'put the infant to sleep in a sack and keep the room temperature appropriate. Do not use excessive cover . . .' this is much too hard for poor families (FG2).

Age group impacted on families' receptiveness to SIDS-prevention messages. Participants found mothers who were middle age or younger were more concerned about health education and interacted more easily with health professionals regarding SIDS-prevention measures. By contrast, very young mothers did not have the same concerns about their infants' health, primarily because this group of women had not yet finished their education, had less life experience and had social networks not yet well suited to sharing knowledge and information about infant care.

Smoking in the family home was another reported cause for concern in relation to providing SIDS-safe environments. The over whelming majority of Jordanian men smoke and most of the staff interviewed agreed that smoking was a difficult habit to change. Infants were therefore routinely exposed to cigarette smoke in their homes: "Commonly, infants are exposed to smoke from their fathers" (FG1). One participant said: "usually smoker husbands are not concerned about the risk of SIDS or other risks caused by his smoking" (FG1).

The neonatal healthcare providers acknowledged the difficulty Jordanian women faced in attempting to keep their homes smoke free. They related countless situations where mothers were regularly exposed to tobacco smoke, both during pregnancy and after delivery: "They [husbands] refuse to stop smoking inside the bedroom" (FG1). Another nurse reported a mother telling her: "I told him [husband] many times to stop it [smoking inside home]. He did not listen" (FG1). Participants also indicated many mothers had difficulty controlling their exposure to tobacco smoke, both within and beyond their homes:

> Mothers complain to us [neonatal healthcare providers] that the hardest thing to overcome is smoking. Mothers are still exposed to smoke and kids are as well. I have met pregnant mothers in the clinic and they explained to me [neonatal healthcare providers] the problem not just at home, it is

> everywhere, even in the workplace they are exposed to cigarette smoking, as there is less restriction on smoking here in Jordan. Now you find the father in front of the heater smoking a packet of tobacco, and the family members, mum and baby beside him in the same room. There was more than one smoker in the same family. The mum's brothers and father's brothers shared Argeileh tobacco smoking including at night, and the baby and mum suffer along with the other kids (FG1).

Participants demonstrated an awareness of the increased risks to infants when both parents smoked. One participant explained: "maybe the pregnant mum is a smoker, also passively exposed to smoke . . . sometimes both parents are smokers, of course in this scenario, the baby is the most exposed and harmed" (FG1). Smoking goes unchecked inside the family home and within close proximity to the infant as parents are unaware of the risks of SIDS.

Focus group discussions with neonatal healthcare providers revealed that even they were unable to defend either their own or their infants' rights to a smoke-free environment: "my husband is a smoker who smokes inside our home, around our kids, and never minds" (FG2) one neonatal healthcare provider declared. The majority of neonatal healthcare providers confirmed they experienced problems controlling smoking habits inside their homes and in the community. The following excerpt from a conversation between two neonatal healthcare providers highlights the difficulty of keeping homes smoke-free:

> P2: I went to visit my husbands' family and the relatives smokes in front of my little daughter; she was only one month age (FG1); P1: When I gave birth to my daughter, it was in winter. The family, relatives and friends came to celebrate this event. We stayed in one room in front of the kerosene heater and there were four smokers around me. P2: Sure you couldn't do anything? P1: What could I do at that time? I can't change the community. (FG1).

Neonatal healthcare providers also commented on the smoking habits of health professionals in Jordan: "Most health professionals here in Jordan are smokers" (FG2) one participant said. Another commented: "Lots of nurses are smokers now" (FG1). They were acutely aware of the inherent paradox in smoking health professionals advising parents about the risks of smoking:

> I have a friend, however she is knowledgeable and her husband is a doctor. He always smokes inside the home and in the car behind his baby, and the baby is now less than six months of age (FG1).

Neonatal healthcare providers indicated that they feel providing a pacifier for infant at bedtime to reduce risk of SIDS would be a very challenging advice. As families in general rely on breast or bottle feeding to get infants to sleep and prefer not to offer pacifiers. Parents associate pacifiers with health problems such as throat infections, gastrointestinal infections and problems with tooth development. They also believe that use of a pacifier would become a difficult habit to break when the infant grows older:

> Offering a pacifier at bed time is thus one of the recommended SIDS prevention measures, which may not suit many Jordanians. Healthcare providers will need to educate parents about the benefits of offering the pacifier and ways to decrease the unwanted side effects. However we still feel it is not important practice [providing a pacifier]. It is more important to advice parents regarding other risks associated with home poor ventilation and smoking, as these are very common in Jordanians' homes. This is especially we have limited time to chat the SIDS prevention messages with parents during our shifts (FG1).

4.10.3 Theme 3: Future directions to reduce SIDS incidence and risks in Jordan

Maternal and child health nurses and midwives at KAUH supported continuation of the SEP in their hospital and suggested expanding it to include the medical staff: "we need to continue using SEP, run the project [SEP] every two years for new staff and include neonatal training physicians" (FG1). The delivery strategies perceived as most effective were workshops, meetings with speakers, and the discussion meetings. Participants also identified a positive role for volunteer trainers and CEP at KAUH in providing regular education and practical support. Involving the CEP at the hospital with the implementation of the SEP proved an effective strategy. Focus group participants suggested inviting keynote speakers from the university to keep hospital staff up to date with the latest information about SIDS. The discussion meetings were regarded as an effective strategy, providing regular support meetings and forum for sharing new knowledge, ideas and experiences. Participants proposed using discussion meetings as an activity for hospital staff to discuss wider variety new and up-to-date information regarding different healthcare practices.

Focus group discussions also recommended making the SIDS education package available to healthcare providers at other health institutions to improve their knowledge and educational practices. Participants proposed that, in collaboration with the Jordanian Health Ministry, each hospital could adapt its own CEP to offer continuing education for healthcare providers throughout the country. They also recommended the development of cooperative

relationships between providers of childbirth services and children's services, as well as with Jordanian universities hosting medical and health colleges. This network of relationships could support the implementation of health promotion programs, similar to the one that KAUH developed in cooperation with JUST University: "if we run the same [JSEP at KAUH] as this in other hospitals or clinics, it will definitely increase our health care providers' awareness about SIDS and enhance their roles in educating families" (FG2).

Strategies to Increase Jordanians' Awareness of SIDS

The qualitative data revealed that Jordanian parents were not aware of SIDS risks and prevention practices, and so were unlikely to ask for relevant information. One participant said: "from my experience parents usually wonder about feeding, growth and development. They never asked about SIDS which is unknown to them. Parents do not know about it. They never asked about SIDS" (FG1). One interviewee highlighted the prevalence of high-risk infant care practices among Jordanian parents:

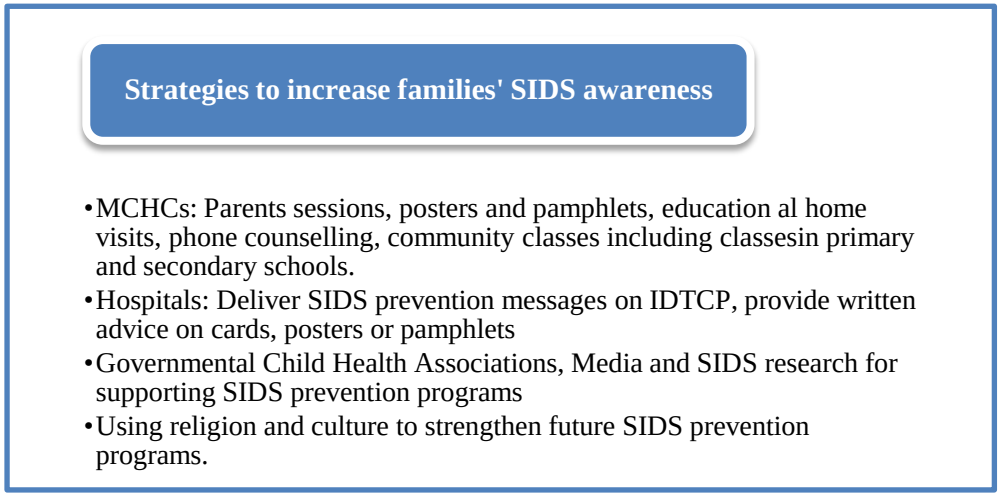
> Last week I went with my mum to visit her niece, she has a newborn baby. During the visit, I saw the mum put her baby to sleep with a heavy dressing, use many quilts and put a sheepskin under him to make sure that he is warm. Moreover, there was a gas heater in the room close to the baby, the windows and the door were closed, and there were lots of visitors sitting in a same room (FG3).

Focus group discussions recommended continuation of the SIDS education in Jordan. Since parents are the primary caregivers, participants suggested involving parents by developing a SIDS education package aimed at families:

> . . . still the issue is how to enhance parents' knowledge regarding how to prevent SIDS risks as parents are central in this. I see an urgent need for comprehensive work on this issue to spread the benefits (FG1).

They suggested targeting the key places that afford contact with parents and caregivers (e.g. hospitals, clinics, MCHCs, homes, schools). One participant said: "if we adapt the current SEP in other health services, it will be effective in increasing community awareness of SIDS" (FG2). Active participation of neonatal healthcare providers and neonatal healthcare services was deemed essential for effective delivery of SIDS-prevention education. These providers and services included child health associations and SIDS campaigns, SIDS research, media, schools, and the health institutes, health care services providing childbirth and neonatal care, such as hospitals, clinics and MCHCs.

The qualitative data pointed to several strategies (Figure 4.8) for effective future engagement with families in Jordan on SIDS education in the health care services.



4-8: Strategies to increase families' SIDS awareness

Focus group participants regarded posters as an effective strategy for educating parents, especially posters printed in colour, and using pictures and easily recognisable symbols: “Posters are always effective. Parents like posters as they could review them so quickly while they waited in the reception area. The SEP posters provided contained simple messages, colour printing, images and symbols” (FG1). Participants believed the SIDS posters: “. . . gave instruction in a very intelligent way as it used colour pictures and an easy message for parents by putting a big tick for the safe practice and a big cross for the unsafe practice” (FG1). Another said: “the posters helped us as well, especially the one with pictures that show exactly the safe and unsafe practice. Parents always look at this and ask about it . . . Relatives also show an interest in getting information on SIDS” (FG2). Staff endorsed the used of posters, which saved them time and proved a quick and easy way of increasing parents’ awareness of SIDS: “We also put posters on wall, so mums have a background on SIDS and it may be easier to get this information again after delivery” (FG1).

Neonatal healthcare providers indicated that when they were busy, they gave written instructions to parents at the time of discharge. Neonatal healthcare providers also advised parents to read the SIDS posters on the wall and encouraged them to call back if they had questions: “. . . due to the busy units and excessive workloads, we found posters most

effective. They save time and we alert parents to them who are able to ask questions if they need more information" (FG1). Neonatal healthcare providers, at NICU suggested providing the infant discharge teaching plan including SIDS prevention advice, as early as possible once the infant get stable and have a plan to discharge:

> Once the infant's condition has stabilised, it is moved to an open cot and we know that the specialist physician must be planning to discharge that infant soon. We then start to educate parents about home infant care including SIDS-safe care practices and safe home environments, and we keep encouraging normal breastfeeding all the time (FG1)

Providing educational pamphlets to parents was considered useful, as they could take them away and share the knowledge with their surrounding communities. In the nursery, a colour card containing SIDS prevention messages was provided to parents as part of the hospital's infant gifts. Workshops and education classes were also useful for parents. Neonatal healthcare providers presented an education class for a group of parents commencing with a demonstration followed by a question session. The benefits of this approach were summed up by one participant who said: "it is important and it is very effective, as it saves time and we can target a larger number and give them an important summary on safe infant care" (FG1).

As mentioned earlier, mothers do not stay long in hospital after delivery, due to both the hospital policy and mothers' preferences. Staff proposed phone counselling and home visits as ways to educate parents post discharge: "Phone counselling could work effectively if we want to deliver the SIDS prevention messages" (FG2); Another participant suggested there: ". . . should be postnatal home visits as mums do not stay a long time after the delivery" (FG1).

Most focus group participants regarded postnatal home visits as a good strategy because they presented an opportunity to cover several topics at once: "we can cover this [SIDS education] if we provide them the right education in the right place and at the right time" (FG2). A further benefit of this strategy was that it did not demand time and attention from hospital staff that were invariably too busy. Postnatal home visits could provide both a demonstration of the SIDS-safe practice and a follow-up to see how mothers are coping with the recommended SIDS-safe measures and practices. It could also potentially identify other challenges or risks to providing SIDS-safe infant care in the home environment.

Acknowledging the difficulties of providing home visits, focus group participants' also recommended using telephone counselling as a way of supporting families with infants and providing timely SIDS-prevention advice:

> I see the home visit as much more comfortable for mum and better than the phone counselling, however it is still difficult to send staff to provide postnatal infant education and care with the problems of staff shortages and time limitation (FG2).

Neonatal healthcare providers acknowledged the importance of targeting grandparents in SIDS education program, alongside with parents and other child caregivers in Jordan. This is because grandparents frequently interact with other community members and grandmothers are recognised as the foremost advisers on infant healthcare practices Participants commented:

> It would better to include grandparents in the education [SEP], this can be done by staff and trainees of the health clinics [which may include MCHCs] of the Jordanian Ministry of Health, as they offer better contact and follow-up with families in their local health clinics. But sure, not through the hospitals, as it will be not effective . . . this related to our situation in hospital work . . . time is not enough and we have staff shortage and less space (FG1).

Focus group participants insisted that local MCHCs were better placed than hospitals to effectively provide both the telephone counselling and home visits. MCHCs provide mothers with pregnancy care, family planning and contraception, as well as infant immunisations and other infant care during the time (first 2-6 months of life) when the infant faces the highest risk for SIDS. The MCHCs staff therefore have strong relationships with families in the surrounding community, which make the SIDS education more valid: "MCHCs staff usually have a trusting relationship with families as they already know them very well. They also can provide phone counselling" (FG2).

As MCHCs are the preferred health institutions for health education among Jordan's families, health professionals and health trainees, it was not surprising that, focus groups recommended MCHCs as the most appropriate base for providing healthcare education, including SIDS. Particularly for large communities, MCHCs can therefore play a pivotal role in promoting SIDS-prevention strategies, because they are the most suitable places for conducting regular community health promotion events:

> In MCHCs there are local regular school education classes, home education visits, phone counselling, education classes, sessions, small group discussions, pamphlets and posters (FG3).

Neonatal healthcare trainees indicated that they can use the education materials of JSEP available at KAUH and presented a SIDS seminar at clinical training days at MCHCs for other health trainees. Neonatal healthcare trainees reported that their following semester started with a Community Health Nursing Clinical Unit (CHNCU) requiring training in MCHCs located in the North of Jordan. As training groups were required to present a topic on community health each semester, one group was planning to focus their presentation on infant care, particularly SIDS. These stated as they were armed with knowledge about this topic and educational materials were readily available, they expected to achieve a high score for this activity:

> Now, we [Neonatal healthcare trainees] are aware of strategies and information regarding SIDS prevention education. How about if we run multiple SIDS education activities during next semester, in CHNCU, our favourer training unit . . . The educational materials were readily and available, we expected to achieve a high score on this activity (FG3).

Neonatal healthcare trainees also proposed using fourth year nursing students undertaking the CHNU from various universities and health institutes to further develop and spread SIDS education among other states in Jordan. As the CHNU includes training at MCHCs in the form of family education (MCHCs classes and home visits), and visits to primary and secondary schools for health education purposes, this strategy could rapidly increase the dissemination of information about SIDS among a large part of the Jordanian community. Participants also suggested that students could as part of their study evaluation develop new SIDS-education tools such as posters and pamphlets, and distribute them in the MCHCs during their clinical training:

> We think MCHCs are the right place for the students to run any educational activities, such as SIDS education ... The most interesting thing about this unit [CHNU] is that it is set in the suburban MCHCs and involves family education classes and family home education visits, as well as primary and secondary school sessions. (FG3).

Neonatal healthcare trainees, who had started preparing for the morning and evening workshops at the MCHCs, mentioned they usually made an invitation to education sessions

related to family health, maternal health and child health, and they posted it on the main door of the MCHC. From past experience of similar events, they expected a minimum of 15 parents to attend each session. Neonatal healthcare trainees also indicated:

> During clinical training, nursing students made some posters using computer technology, colour printing and a glass frame to protect it. Parents like them [the posters] so much. Some posters are still on the wall five years later and parents are still reading them. No one has yet made a poster about SIDS. We [Neonatal healthcare trainees] may make one as a part of our training requirements for the CHNU (FG3).

The qualitative data acknowledged the need for educating families and highlighted the high risk groups, such as the Churl, Bedouin and refugee families, who live in Jordan's remote rural and desert areas. Participants indicated that these families interact socially in their community's tents or homes, where exposure to tobacco smoke, kerosene smoke and wood smoke is a normal part of life. Often these families were less educated and do not aware about the risk practices:

> . . . hope we can run some activity in the MCHCs and especially in the rural and Bedouin areas which have a greater risk of SIDS, because they have less paid employment than those parents with better education, and little knowledge of the risk practices (FG3)

It also suggested using some big events for health in the country to share the SIDS prevention massages and contact parents and their families attending these activities. Such as Open Clinical Day, (a free community health service runs yearly in the MCHCs around the country): "for training students, participation in this activity formed part of their CHNCU clinical evaluation, so may they can delivered the SIDS prevention recommendation to families attend" (FG3). Neonatal healthcare providers also observed that health educators' interest in SIDS had surged since implementation of the program. One participant suggested holding a big workshop activity to enhance awareness of SIDS prevention practices for health educators from different health institutions and universities around the country.

Roles of Governmental Child Health Associations, Media and SIDS Research

Focus group discussions indicated that Jordanian families had not received any information on SIDS, not even from national publications, media or health associations. One participant commented: "this is new knowledge for them. They [families] never get information on this [SIDS] even from publication media or the health associations" (FG1). Focus group

participants recommended increasing Jordanian awareness of SIDS risks and relevant preventive measures, and acknowledged that this would require support from governmental organisations, local media, and more research and investigation of SIDS in Jordan. Participants suggested SIDS associations in other developed countries may be able to play a role. They also recommended the Jordanian Ministry of Health be involved in SIDS initiatives, in order to bring about positive change:

> We hope there will be an infant association in Jordan to support SIDS prevention; like ones in western and developed countries, to provide support for families of lost infants. Maybe could help poor families and provide some financial support, or even provide education resources for all community members. It may also support our roles in order to prevent SIDS. Maybe also offer continuous education for healthcare professionals around the country, and the Jordanian Ministry of Health should be involved (FG2).

Staff explained they were constantly juggling between providing healthcare services and advising on healthcare practices. Focus group participants proposed getting political support for a comprehensive SIDS education program for families in Jordan. Participants agreed the media was a powerful vehicle for enhancing the community's health knowledge and that it could play an important role in future health promotion programs such as SEP in Jordan. ". . . We still need media support. Media is a strong way to keep parents aware of SIDS risk factors and prevention practices, especially TV" (FG1).

There are no statistics on the rate or incidence of SIDS among Jordanian infants; however, anecdotally there are instances where infants have died from 'unknown causes'. Participants suggested developing tools to capture statistics on SIDS in Jordan, especially in the poor areas. One focus group participant explained:

> We hear that infants died from unknown causes, but they were not documented as SIDS cases. They just sign the death certificate that the infant died from unknown causes and sometimes they record a wrong diagnosis. Many deaths occur and we are not aware that it is SIDS, and there might not be a diagnosis of SIDS (FG1).

Focus group discussions highlighted certain concerns among healthcare providers in Jordan regarding the numbers and causes of infant deaths, especially in winters. Focus groups also affirmed that the climate in Jordan appears to have an impact on the occurrence of SIDS:

"Mainly in the winter there are many cases where babies die, related to this unsafe practice, such as sleeping close to the heat source in a poorly ventilated room" (FG1).

Staff believe that while SIDS-education is important to enhance the knowledge among families but further effort and support is required from the government to change the risky practice and risky home environment, such as smoking: "it is important to know the risks [SIDS risks] but most important is to stop the risk" (FG1). Participants suggested substantial need to run anti-smoking programs alongside SIDS education programs for Jordanians.

Using Religion and Culture to Strengthen Future SIDS Prevention Programs

While acknowledging the benefits of drawing on SEP developed elsewhere, focus group participants felt that an effective future SEP in Jordan should offer a lead to other Middle Eastern countries by highlighting Islamic principles supporting SIDS education, and promoting use of Alghmatte. Being Muslim themselves, participants were aware of the Islamic principles for infant care that could support further development of the SEP. According to Sharia, Muslims have a responsibility to follow the word of Allah in order to receive His gratitude and blessings, as well as seeking new knowledge and making it available to the community. One focus group participant explained:

> As we are all Muslims, we need to work right to receive Allah's gratitude and blessings. Indeed, we must not hide any useful knowledge, and we are responsible for seeking useful science to provide to our community, as well as putting it into practice. (FG2).

Muslims believe that death occurs by 'gader' (fate or destiny), it is the will of Allah and they are therefore powerless to prevent it. Nevertheless, they have an obligation to provide the best quality care for their infants in order to meet their Sharia obligations.

> We believe that death occurs by 'gader'. If the baby is supposed to die, he will die despite everything we did to keep him alive . . . Life is not in our hands, it is owned by Allah . . . when the baby is 'ALAGAH' [conceived in the mother's uterus] his life is written, so we can't change the 'gader'. If we provide the right quality care for babies this will make us feel less guilty . . . 'gader' is the will of Allah, but we have to provide the best quality care (FG1).

Focus group discussion also revealed that healthcare providers consider use of Alghmatte to be a safe infant care practice: "I see it [Alghmatte] as very useful and low risk" (FG1). Because it keeps the infant warm with only light clothing, the infant is unable to move and

shift the bedding over its face. Participants describe the Alghmatte mattress as comfortable, being light and soft and made from pure cotton. It is also inexpensive and readily available in infant shopping stores. One participant said: “To me it looks ideal for the baby. Maybe it is the best ever” (FG1). Another said: “We inherited and cannot swap or skip it.” (FG2). Participants used swaddling in the hospital and preferred using Alghmatte on their infants at home. Nurses and midwives recommended this practice to new parents and promoted Alghmatte as the best way to hold an infant and keep it warm while sleeping. One participant said:

> Never have I heard that a baby dies suddenly from Alghmatte. Always baby that have not used the Alghmatte may have this risk. Unfortunately there are no statistics available, but from my view and our experience with infant care; babies without Alghmatte can turn round, shake his hand, so may cover his face (FG2).

4.11 PHASE THREE SUMMARY

This section reported the qualitative results of phase-three, which supported the quantitative result. The focus group discussions revealed positive perceptions regarding implementation of the JSEP in Jordan. The focus group participants reported their involvement with the JSEP had improved their knowledge of SIDS, as well as, their confidence and ability to provide the SIDS prevention advice to parents, their families, and other child caregivers regarding SIDS risks and prevention practices. In addition, the focus groups highlighted some challenges in providing the SIDS education to families and suggested some strategies to reduce SIDS risks in Jordan as well as future directions to develop the JSEP. The next chapter discuss all these findings from both qualitative and quantitative data.

Chapter -5- DISCUSSION

This study converted evidence based knowledge about SIDS into action in a real world hospital setting. An educational intervention was adapted from programs implemented in Western developed countries (USA and Australia) and was implemented at KAUH, the main educational hospital in Jordan. Great care was taken to ensure cultural sensitivity in bringing what is an essentially Western concept into an Eastern healthcare setting in a developing country. This study was the first of its kind to examine the feasibility and effectiveness of a SIDS education package in Jordan. In addition, this project was the first to assess infant positioning practices among Jordanian healthcare providers in the Middle East region, and the first to consider the role that Alghmatte, the traditional swaddling for infants, could have on SIDS prevention program. It is also the first study to consider the role of health care providers in educating families in Jordan about SIDS.

The previous chapter outlined the quantitative and qualitative findings regarding implementation of the JSEP in a hospital setting in Jordan. This chapter discusses the implications of the implementation of the JSEP and highlights the main areas of concern regarding the reduction of SIDS risks in Jordan. It suggests directions for future research and makes recommendations to reduce the risk of SIDS by changing nursing and midwifery education and practices. Strengths and limitations were discussed in the context of the contemporary literature on SIDS prevention strategies. This chapter discusses the main outcomes of this study conducted to answer the research questions explained in the table in the following page.

	Research questions
Phase-1 Baseline data collection surveys	- Do neonatal healthcare providers practice SIDS-safe positioning for infants sleeping in cots in the hospital setting? - Are the hospital's neonatal healthcare providers aware of the current SIDS risks and prevention guidelines? - What knowledge, perception, and beliefs, do neonatal healthcare providers have regarding SIDS-safe positioning practices? - What resources do the hospital's neonatal healthcare providers use to access information on SIDS risks and prevention practices? - Do the hospital's neonatal healthcare providers provide families with any education relevant to this topic?
Phase-2 Post-intervention data collection surveys	- Does the JSEP improve the SIDS-safe infant positioning practices by neonatal healthcare providers in the hospital setting? - Does the JSEP improve the SIDS knowledge, and ability to access appropriate SIDS resources among a convenience sample of neonatal healthcare providers in Jordan? - Does the JSEP improve the practical ability to educate families regarding SIDS risks and prevention practices, among convenience sample of neonatal healthcare providers in Jordan?
Phase-3 Post-intervention Focus groups	- What are the challenges and future directions for SIDS prevention in Jordan?

This study included three phases of data collection. In the phase-one, the baseline data was collected via two surveys, namely an observation-survey to observe practice and questionnaire to evaluate knowledge and beliefs of staff. The observation-survey for infant sleep positions in neonatal units at KAUH determined the level of practice, in accordance with international guidelines regarding SIDS-safe sleep positions, were evidenced in the care provided at the hospital setting prior to the educational intervention. The questionnaire-survey explored the baseline information of current SIDS knowledge among KAUH neonatal healthcare providers, and SIDS information resources they accessed, prior to the educational intervention. It also explored their practical ability to educate parents, their families and other child caregivers about this topic.

Based on the baseline findings in the phase-one, a hospital-based SIDS intervention program (JSEP) was developed and implement to the neonatal healthcare providers at KAUH. The JSEP implemented in a three stages over seven weeks. Stage-one was a train-the-trainer exercise, undertaken over two weeks by the researcher. Stage-two required volunteer trainers to train a convenience sample of neonatal healthcare providers over three weeks, with the researcher support. Stage-three involved post-education support and follow-up provided by the volunteer trainers supported by the researcher and hospital key-stakeholders. Following

the intervention, the researcher repeated the surveys conducted prior to the intervention. The observation-survey was undertaken in the neonatal units, to evaluate changes in the providing a SIDS-safe positioning practices. The questionnaire-survey was conducted among the neonatal healthcare providers, who exposed to the JSEP, to evaluate the impact of the education intervention on SIDS knowledge and accessing appropriate SIDS information resources, as well as the impact on educating practices for families regarding SIDS.

Finally, the focus groups were conducted in phase-three data collected, among purposeful sample of neonatal healthcare providers, who exposed to the JSEP. This focus groups explored study participants' experiences of undertaken the JSEP, and shed lights on their challenges in providing SIDS education to families and discovered a future directions for further improvement for the program and to reduce the incidence of SIDS in Jordan.

4.12 KNOWLEDGE AND PRACTICE FOR SIDS-SAFE POSITIONING

This was the first time that a study considered infant positions in a Jordanian healthcare setting. The study provided baseline information about current sleeping positioning practices for healthy and medically stable preterm and full-term infants, sleeping in neonatal open cots at KAUH, prior to the intervention. Current recommendations based on the best available evidence identify the supine sleep position, as the only SIDS-safe sleeping position for healthy and medically stable full term or preterm infants (American Academy of Pediatrics, 2013; APA, 2011b; Athanasakis et al., 2011; Byard, 2001). The baseline study findings of the ISPQ questionnaire-survey showed that neonatal healthcare providers lacked awareness of the SIDS-safe position recommended for infants to sleep. Only less than one-quarter (21%) of neonatal healthcare providers identified the accurate SIDS-safe sleep position and indicated that the supine position as a practice to reduce the risk of SIDS. Furthermore, a very high proportion (75%) of neonatal healthcare providers did not recommend using the supine positioning only, and believed that used both supine and side positions as a preferred practice. Many provided the reasoning that using the supine positioning only can increase the risk of aspiration, may cause the infant to have a flat head, and may exacerbate infant reflux. Furthermore, the baseline of total of 403 observations for infant sleeping positions found no healthy and medically stable infants were placed in a prone position in open cots. Jordanians commonly believe that sudden death is associated with prone position which would also account for why this position was avoided. Almost half of 403 total observations recorded

prior to the intervention, identified infants placed in their sides to sleep, which is also a non SIDS-safe position.

These findings revealed alarming level of lack of understanding and ignorance regarding the SIDS-safe sleep positioning practice in Jordan. This is also revealed an alarming level of risk in infant sleeping positioning practice within the hospital, but was of no great surprise as placing infants on their side is a common practice among Jordanian healthcare providers and families. Of further concern, this was not considered problematic by the neonatal healthcare providers, despite the literature demonstrating that side sleeping increases the risk of SIDS. These baseline study findings support other research published in developed countries, including Aris et al. (2006); Bullock , et al., (2004); Grazel, et al., (2010); Lerner, Mcclain, & Vance, (2002); and Wilson, et al., (2010), all of whom found that neonatal healthcare providers still use un-safe SIDS positioning practices. In addition, neonatal healthcare providers have inconsistencies and vague knowledge about SIDS prevention practices. While, in Jordan only a few resources were available to neonatal healthcare providers to improve their knowledge and practice regarding SIDS prevention. Therefore, what the observation of infant positioning practices contributed to this study was an important additional source of data to evaluate the impact of the educational program and validate the findings. It is recommended that future studies include multiple sources of information rather than depend primarily on self-report, which is the state the literature at this time.

4.13 KNOWLEEDGE OF SIDS PREVENTION PRIOR TO THE INTERVENTION

The study also provided baseline information about neonatal healthcare providers' awareness of SIDS prevention guidelines in accordance with the American Academy of Pediatrics (2011), as outlined in the literature review. The study found a large proportion (40%) of neonatal healthcare providers' was unaware about the guidelines. However, SIDS literature such as American Academy of Pediatrics (2013); Abdulrazzaq, Kendi, and Nagelkerk (2008); Aris et al.(2006); Moon, Oden, and Grady (2004); and NICHD (2010) recommends that neonatal healthcare providers' need to be aware about the update child healthcare knowledge and used the recommended evidence based practices. The study also examined neonatal healthcare providers' level of recognition and agreement with the recommended SIDS prevention practices. Prior to the intervention, neonatal healthcare providers were unaware of the international guidelines of SIDS prevention practices. The baseline study findings

revealed an alarming level of risk linked to lack of awareness, and recognition of the practices that recommended reducing SIDS risks. For instance only 19% of participants' supported the correct statement that 'infants should be given a pacifier when they are put to sleep to reduce the risk of SIDS' and only 31% of participants' agreed that 'all soft objects such as, pillows, blankets and quilts should be removed from the infant's bed'. In addition, only 47% of participant responses agreed with the statement that smoking in the infant's home environment would increases the risk of SIDS and only 52 % believed that 'breastfeeding helps to reduce the risk of SIDS'. While greater numbers of neonatal health care providers (60%) agreed with the true statement that 'infants should sleep close to their parents but in a separate space', this was probably due to cultural reasons rather than an awareness of recommended SIDS risk reduction practices. This cultural influence was similarly a likely influence in the high proportion (68%) of neonatal healthcare providers agreeing with the incorrect statement that 'infants should be clothed so they are warmer compared to adults in the same room'. This again is of considerable concern as it is highlighted within the literature as a high risk practice in relation to the incidence of SIDS.

These baseline study findings also supported other research published in developed countries, including Aris et al. (2006); Bullock , et al., (2004); Grazel, et al., (2010); Lerner, Mcclain, and Vance, (2002); and Wilson, et al., (2010), all of whom found that neonatal healthcare providers still not only a lack of understanding, but also opposing beliefs from the SIDS prevention recommendations. More effort needs to be taken to address the public health gap concerning SIDS and SIDS risks in Middle Eastern nations. Only few efforts, in the form of a survey, have as yet been conducted in Middle Eastern countries including Turkey, UAE, and Israel. The baseline findings reinforce the literature that suggests a growing need for greater public health education efforts.

4.14 RESOURCES TO ACCESS SIDS PREVENTION INFORMATION

The literature recommends that neonatal healthcare providers need to access evidence based professional resources to inform healthcare practices (American Academy of Pediatrics, 2013; NICHD, 2013a). The study investigated resources that neonatal healthcare providers' commonly used to access the knowledge about SIDS prevention. Thirty-three percent of neonatal healthcare providers participating in this study indicated that they had never accessed resources with information about SIDS prior to the intervention. A very low proportion (8%) used combined resources of colleagues' advice, mass media, the hospital's

Continuous Education Program (CEP), and professional journals to access knowledge about SIDS. The communication between staff about SIDS knowledge appears not to have been effective prior to the intervention, as not only was their knowledge poor, only 26% indicated they depended on colleagues' for advice regarding SIDS. Similarly, mass media appeared not to be an influence as only 20% of total neonatal healthcare providers identified this as an information source. Of particular concern only 3% of neonatal healthcare providers indicated that they access professional journals for information.

While there is considerable research and evidence based guidelines available on SIDS prevention in developed countries, such as USA, UK, Canada, and Australia, less attention has be given to SIDS research and protocols in the Middle East region. This is an alarming finding, especially as the hospital's CEP did not address the topic of SIDS, despite its importance for infant healthcare practices, and further to this only 3% of total participants indicated that they access this knowledge via the CEP. The hospital's CEP need to take SIDS education as one of its priority topics need to be covered, especially after the baseline study findings revealed a gap in knowledge and practices among Jordanian neonatal healthcare providers. It is clear that, developing and implementing a SIDS education package is a substantial need in Jordan.

4.15 PARENTAL/FAMILY SIDS PREVENTION INSTRUCTIONS

The literature highlighted the importance of neonatal healthcare providers' role as educators to families, which can impact on parents' practices and reduced SIDS incidence (Moon et al., 2004; NICHD, 2013a). The baseline findings revealed an alarming level of misinformation and a general lack of understanding among neonatal healthcare providers of their role in reducing the incidence of infant deaths. Furthermore, the baseline study found those neonatal healthcare providers did not pay the enough attention to educate parents regarding SIDS and the advice routinely provided by neonatal healthcare providers actually heightened the risk of SIDS. SIDS education was not covered in the CEP for neonatal healthcare providers in Jordanian hospitals, which results in an increasing the gap between knowledge and practice of Jordanian healthcare workers and the rest of the developed world.

As a result of neonatal healthcare providers' lack of knowledge and understanding regarding SIDS risks and prevention practices, any information provided in the pre intervention period was likely to be wanting. It was not surprising therefore that that the majority of the neonatal

healthcare providers indicated that they do not often provide the SIDS risk reduction advice to parents and caregivers. This is however contradictory to the recommendations within the literature that neonatal healthcare providers' who care of pregnant mothers and infants should provide the education regarding SIDS risk prevention to families. This is an considered result, especially the baseline study findings, revealed that the highest proportion (79%) of neonatal healthcare providers indicated that they rarely provided SIDS prevention education to parents, their families and other child caregivers.

In order to reduce the SIDS risk, it is recommended; placing infants only on supine position to sleep: parents should avoid sharing the sleeping surface with infant: avoid using of excessive clothing, layers of covers or caps: and put infant to sleep on light clothes (American Academy of Pediatrics, 2013; Aris et al., 2006; NICHD, 2013a). The baseline study findings revealed that the advice routinely provided to parents, their families and other caregivers regarding infant positioning, clothing and bed sharing, actually heightened the risk of SIDS. In particular, that the study found that the highest proportion (44%) of neonatal healthcare providers indicated that they commonly advised parents, their families and other caregivers to place infant on either side or back to sleep and place infant on side to sleep with positioning rolls. Furthermore, most common advice provided for infant clothing practices is to swaddle their infants with extra layers, and use additional caps or blankets, with this practice recommended by a majority (64%) of the neonatal healthcare providers within this study. In addition, (39%) of them advised, that it is acceptable practice to share a bed with an infant to allow the mother to bond with infant, to assist breastfeed at night, or if the parent was concerned about infants' health.

The literature recommended against using soft objects on infant bed such as stuffed animals, blankets, pillows, quilts, sheepskins, bumper pads and wedges, as this can increase the risk of SIDS (AAP, 2011; Athanasakis, et al., 2011;(Blair et al., 2008). As discussed in the introduction chapter, these objects are commonly used in infant bedding by Jordanians, especially blankets, pillows, quilts. The baseline study findings revealed that the advice routinely provided by neonatal healthcare providers to parents, their families and other caregivers regarding use of soft objects in the infants bed, actually could heighten the risk of SIDS. Having objects such as stuffed animals, blankets, pillows, quilts, sheepskins, bumper pads and wedges on infants' beds was not considered by neonatal healthcare providers as un-

safe practice prior to the study intervention. In contrast, the majority of neonatal healthcare providers encouraged parents, their families, and other child caregivers to add these objects in infant beds.

While American academy of pediatrics recommend offering infant a pacifier at bedtime can reduce the risk of SIDS. The current Jordanian study revealed that high proportion (31%) of neonatal healthcare providers at KAUH were routinely advised against using pacifiers. This was influenced by the dominant culture among Jordanians, however the hospital policy encourages offing pacifiers to neonatal infants.

These findings revealed consideration level of ignorance regarding infant healthcare practice in Jordan. Neonatal healthcare providers did not recognise the importance of their roles as educators to parents, their families, and other child caregivers, on SIDS-safe sleeping practices and SIDS-safe home environments. This is alarming, especially where Jordanians, homes and their practices for infant care are recognised in this study as heightened risk of SIDS (as discussed in study introduction and literature review). Furthermore, not only was the lack of knowledge of the neonatal healthcare providers a concern, but the clear indication that they routinely provided information that was in opposition to the SIDS reduction recommendations is clearly problematic to SIDS risk reduction. Failure to educate parents, their families and other infant caregivers about SIDS risks and prevention practices appear to be placing infants at unnecessarily high risk of SIDS in both the hospitals and at home. Especially, it appears SIDS incidence is estimated high in Jordan, as it contributed 6% to the infant mortality rate, only among infants in Northern Jordan (Bataineh, Shawagfeh, et al., 2008). Furthermore, unexpected death cases among Jordanian infants often having no clear cause or accurate diagnosis (Khoury & Mas'ad 2002). Furthermore, international literature showed that SIDS is seasonal and increased in winters (Leach et al., 1999b; NICHD, 2013b), and in Jordan appeared common deaths and suffocation among children occur during winter months.

4.16 IMPACT OF THE INTERVENTION ON NEONATAL HEALTHCARE PROVIDERS' SIDS RISK AWARENESS AND PRACTICES

The interventional phase examined the differences of neonatal healthcare providers' pre/post level of awareness of SIDS prevention information, if there were any improvements on providers' knowledge, perceptions and beliefs regarding SIDS prevention information,

whether it changed neonatal healthcare providers' behaviour regarding safe infant positioning practices, whether it improved access to appropriate resources for SIDS knowledge, and investigated changes in neonatal healthcare providers' behaviours in providing SIDS instructions to parents, their families, and other child caregivers following the hospital-based SIDS intervention program.

Following the hospital-based SIDS intervention program, there was a significant improvement of neonatal healthcare providers' awareness and recognition of the SIDS risks and prevention practices. SIDS-safe positioning practices significantly improved in the neonatal units at KAUH following the hospital-based SIDS intervention program, with p-values of less than 0.05. The proportion of healthy and medically stable preterm/full-term infants in open cots placed on supine position to sleep was increased to three-quarters of total 400 observations in the post period compared to half of total 403 observations in the pre period. In addition, there was a significant decrease in the use of the side sleeping position to a quarter of these total observations. This was a very positive change especially as it is a common practice among Jordanians to put infants in a side position to sleep.

The neonatal healthcare providers' knowledge about SIDS prevention guidelines released by the American Academy of Pediatrics (AAP) was demonstrated to have significantly improved following the intervention. In addition, there was improvement on the recognition of the international recommendations of SIDS prevention practices as shown in the positive changes in agreement levels with the recommendations pre/post intervention. Specifically, neonatal healthcare providers increased their recognition of the risk associated with bed sharing with infants, having soft objects on infant sleeping surface, and using multiple layers of swaddling and excessive clothing for sleeping infants. They also recognised the increased risk associated with smoking inside homes around infants. Furthermore, neonatal healthcare providers recognised the importance of initiation and maintaining breastfeeding to reduce the risk of SIDS and the role of pacifiers in reducing the risk of SIDS.

All these changes indicated the effectiveness of the JSEP educational intervention as well as providing an action research approach to the education and behaviour change of clinicians in a busy hospital setting. The intervention effectively impacted neonatal healthcare providers' knowledge, perceptions and beliefs about safety of SIDS risk reduction recommendations,

prevention practices and safe infant sleeping positions to reduce the risk of SIDS. The post intervention data showed that all ISPQ score changes were statistically significant following the intervention, with p-values of less than 0.05 across all items. Specifically, following the intervention, there was improvement in knowledge and beliefs about SIDS-safe sleeping positioning, with the recognition of the risk of using other positions rather than the supine for infants to sleep. Furthermore, the change in the pattern of perceptions about SIDS risks and sleeping positions was also improved.

4.17 IMPACT OF THE INTERVENTION ON PARENTAL/FAMILY SIDS PREVENTION INSTRUCTIONS

The intervention demonstrated effectiveness on neonatal healthcare providers' education activities for parents, their families and other child caregivers regarding SIDS risks and prevention practices. The intervention study phases found all the family instruction scores post intervention were statistically significant, with p-value less than 0.05. Previously, most providers rarely provided SIDS information, and post intervention, this activity increased to "sometimes" providing this information. Following the intervention, advice was provided by the neonatal healthcare providers on infant sleep care practices were accurate in terms of SIDS risk prevention. For example, the majority of neonatal healthcare providers recommend placing infants on their backs, they also did not recommended the bed sharing for parents, and mostly advised that having objects such as blankets, pillows, quilts, sheepskins, bumper pads, stuffed animals and wedges in infants' sleeping space were considered high SIDS risk practices. In addition, the neonatal healthcare providers also advised parents to offer pacifiers for infants at bedtime for infants who on bottle feed, and after breast feeding is well established.

The intervention has shown that a JSEP program has not only changed neonatal healthcare providers' knowledge but has impacted their clinical behaviour as well. The increase in accurate advice being provided by those providers involved in the education may, in the long run, influence an increasing number of parental practices as well as other clinician's activities, especially those not involved in the intervention program. Thus, one can hope that this small pilot project effort, if expanded and built up, can have a positive impact on SIDS incidence rates, at least in the KAUH maternal patient population. As stated in the introduction, the goal of this research is to provide a platform for an expanded and enhanced

approach to SIDS education and training in Jordan overall. The results from this project are extremely promising and may bode well for the future of Jordanian families.

4.18 CHANGE THEORY AND THE JSEP INTERVENTION

Behavioural change theory is a multiple stage process shown to be effective in producing changes in individual behaviour. This framework was applied to the development and implementation activities of the JSEP intervention to facilitate clinician awareness, knowledge and subsequent change in clinical practices. As described in Chapter 3, multiple activities, train the trainer models and supplemental education and public awareness materials were utilized to encourage behaviour change. As a result of this approach to education and change within the hospital setting, there was an improvement on neonatal healthcare providers' ability to provide accurate SIDS information to parents, their families, as well as other child caregivers which is quite impressive change in a developing country. This is especially so for Jordan where the topic of SIDS has not been sufficiently included in any public health education program before this intervention and where massive risk of SIDS has been identified.

Overall, post-intervention study findings indicated that the hospital-based SIDS intervention program was effective and feasible. It improved not only neonatal healthcare providers' awareness about SIDS risks and prevention practices; it also improved their practical skills in parental/family education regarding SIDS. In addition, not only was there improvement in neonatal healthcare providers' knowledge, perceptions and beliefs regarding SIDS-safe sleeping position; but their practices for SIDS-safe sleeping positioning were also significantly improved, which reinforce and further strengthen the results regarding the effectiveness of the program.

4.19 IMPACT ON THE EXPERIENCE OF INTERVENTION PARTICIPANTS

Focus groups affirmed the observation and questionnaire survey's results of phase-one and Phase two. Communication with neonatal healthcare providers in the focus groups indicated that, prior to the hospital-based SIDS intervention program, known as JSEP, their knowledge of SIDS was vague and inconsistent. They also had confusion beliefs regarding SIDS prevention practices, such as providing pacifiers to infants at bedtime, placing infants on their backs to sleep, and removing soft objects such as pillows from infants' sleeping beds. Neonatal healthcare providers indicated that they, like other Jordanians, commonly put infants on their sides with the view that this reduces the risk of vomit aspiration. They also

indicated that they often changed the infant positions between both sides and back to reduce the chance of flat head. Neonatal healthcare providers had also been less confident to provide the accurate advice for SIDS prevention practices, especially that this topic had not been addressed before in any training event among the hospital. Furthermore, neonatal healthcare providers indicated that, prior to the SIDS prevention program; they did not focus on SIDS education to parents, either during infant's hospitalisation or at the time of the infant's discharge. This however, they indicated parents, their families and other child caregivers would be unaware about SIDS and relevant risks. The worst that they encouraged parents to provide infant care practice that actually could heighten the risk of SIDS.

These findings support the literature such as Inbar et al., (2005); Efe, Sarvan, and Kukulu, (2007); Abdulrazzaq, Kendi, and Nagelkerke, (2008); Bataineh, et al. (2008); Khoury and Mas'ad (2002); Nofal, Abdulmohsen, and Khamis, (2011); and Yikilkan et al., (2011) that suggested healthcare providers in the Middle East appear to have not the enough information regarding SIDS prevention practices. These findings confirm the initial assumption of this study which was that educated and well-trained healthcare providers can potentially positively impact parental behaviour and perhaps over the long term, SIDS incidence. It also confirmed that the need of continuous training for neonatal healthcare providers is a substantial need in Jordan and in the other countries in the Middle East. While this topic has been addressed in the developed countries and many education campaigns have been provided, less effort has been provided to address this problem in the developing and Middle Eastern countries.

The focus groups affirmed the results from the practice observations and the questionnaire results in phase-two, and revealed a willingness to for neonatal healthcare providers to develop their role in SIDS risk prevention advocates. The neonatal healthcare providers indicated that they had altered their practices to be SIDS-safe, both in the hospital as well as in their own homes. Participants also reported positive changes in infant discharge teaching plan at KAUH. The focus group participants reported their involvement with the JSEP had enabled them to provide the SIDS prevention advice to families, stating their knowledge of SIDS had improved, improving their confidence and ability to provide the SIDS prevention advice. This led to improvements in their roles and skills, as educators to parents, their families, and other child caregivers, during their work duties in the healthcare settings, as

well as during their daily life in their homes and surrounding community. They also shared this knowledge with their own families and relatives and encourage them to follow the guidance of infant sleep care practice for low SIDS risk care. These findings support literature such as Airs et al., (2013), Grazel, Phalen, and Polomano (2010); Moon and Oden (2003); Moon, et al., (2008), Mcmullen, Lipke, & Lemura, (2009); and NICHD (2010) whom all found that by providing a SIDS education program to neonatal healthcare providers, staff knowledge and practices regarding SIDS prevention improved, and their contribution parental education regarding SIDS prevention improved.

4.20 CHALLENGES TO SIDS PREVENTION IN JORDAN

A number of challenges were identified in providing parents with SIDS education by hospital's healthcare providers. In Jordan, there is a short window of opportunity for staff to meet parents and discuss the SIDS education prevention, as the hospitalisation policy for women have normal delivery up to 42 hours. This relatively short hospital stay period is as a consequence of a high the demand for the facilities. With the current problems of overload work, time limitation, and staff shortages this rapid turnover of birthing mothers makes it even more difficult for Jordanian healthcare providers to provide sufficient education for parents regarding SIDS risk prevention. Hence, as the later recommendations will detail, additional public health initiatives are also required to enable an extended change to practice.

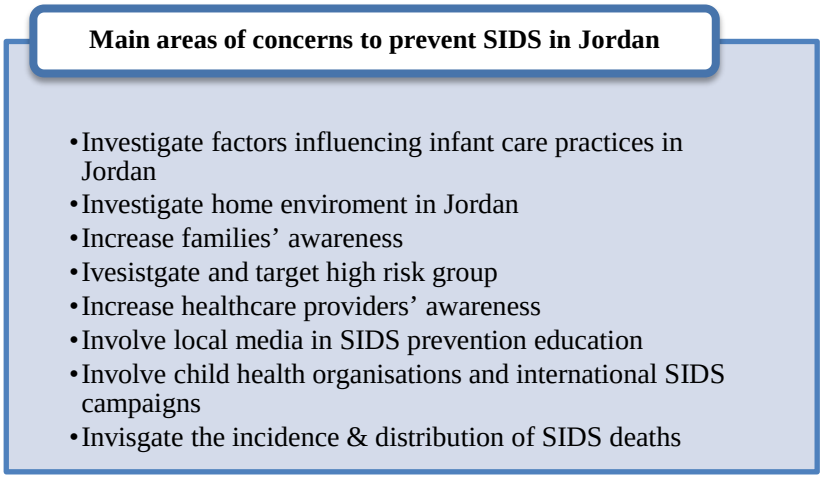
The community circumstances and population characteristics have been identified as challenging for the Jordanian healthcare providers when providing the SIDS prevention education. Jordanians themselves also experience challenged when attempting to practice SIDS-safe infant sleep care, or having a SIDS-safe home environment. The neonatal healthcare providers indicated that Jordanians winters are often cold, and the low economic situation among Jordanians having little financial resources, lead them to adapt with winters' cold using risky practices. For example, Jordanians add extra clothing and wrapping to their sleeping infants to keep them warm, while this practice could increase the risk of SIDS. They also use basic heating resources and keeping windows and doors closed to have a warm home, while poor ventilation increase the risk of SIDS.

Smoking is one of the most factors that challenging the SIDS prevention in Jordan. Like other Middle East cultures, the male is the dominant in Jordan and women find it difficult to change men's smoking behaviors or stop them to smoke inside their homes, around them and

around their children. The scenario is the worst in Jordan, where smoking rate is the highest in the Middle East, and where more than 60% of Jordanian men currently smoke (WHO, 2009a).The risk escalates when there is more than one smoker among the family members. In Jordan there are less restrictions for smokers than countries such as Australia, and as such people commonly smoke in homes, on public transport and in other public settings, without any regard for pregnant women, infants and children's' health. The attitudes of smoker Jordanian men is highly challenging for those wanting to provide a SIDS-safe environment for infants. Furthermore, people cannot easily take assertive action to stop their passive exposure to the smoking, especially women and children whom are least able to assert themselves in this highly male dominated community.

4.21 DIRECTIONS TO REDUCE SIDS IN JORDAN

This study led to a plan for the future development and implementation of an effective SIDS prevention campaign in Jordan. Figure 5.3 outline the directions for SIDS prevention in Jordan.



5-3: Directions to reduce SIDS incidence and risks in Jordan

Future directions to prevent SIDS in Jordan require consideration of factors influencing the infant care practice in Jordan, and further investigation to evaluate the home environment and indoor air quality in Jordanian homes. Effective strategies are needed to increase families' awareness and knowledge about SIDS and minimise high-risk infant care practices. Future SIDS education needs to involve parents, grandparents, and other child caregivers among the family in the education, including oldest children as they often help their parent looking after

the infant and providing the care. This is important to keep the infant safe at all times and to minimise the chance of being exposed to unsafe care practices. It is also important to identify and target the families with a higher than average risk of infant deaths due to SIDS, such as families of infant with LBW or premature. Families with poor financial circumstances and have also poorly educated will need the greatest support. Neonatal healthcare providers acknowledged the need for educating rural, Bedouin, and refugee families living in such isolated areas including highlands and deserts, as they identified as a high risk groups.

The findings from this study, particularly the participants comments in the focus groups, that due to the busy nature of the acute hospital setting, perhaps other venues would for SIDS education would be appropriate. In Jordan, the continuous access to mothers and their families at Maternal and Child Health Centres (MCHCs) were suggested as a supplemental, and perhaps, primary place for sustained and long-term SIDS education. Neonatal healthcare providers highlighted the importance of using education classes, group discussions, home visits, phone counselling, and visits to primary and secondary schools, via the local MCHCs for health education purposes including SIDS prevention. Neonatal healthcare providers also highlighted the importance of using posters and pamphlets to educate families in healthcare settings and homes about the best care practice and home environment to keep infant SIDS safe.

SIDS awareness needs to be enhanced among neonatal healthcare providers (professionals, educators, and trainees) in order to play a bigger role in disseminating SIDS-prevention messages in their workplace. Further development of JSEP at KAUH is also recommended to extend this experience to other healthcare settings in Jordan or in the Middle East region. Finally, for further developing for SIDS prevention in Jordan needs more political interview and support from media. Focus groups indicated that some infants died with the cause unknown, this raises the need for further investigations into the incidence, prevalence, and distribution of SIDS in Jordan. Support from international Child Health Associations and international SIDS-prevention campaigns will assist with implementing SIDS prevention education programs in Jordan by targeting both healthcare providers and high-risk families.

4.22 STUDY STRENGTHS

This study used mixed method design to evaluate the feasibility and effectiveness of implementing a hospital-based SIDS education package, and to introduce evidence-based changes for SIDS prevention strategies in Jordan. Using mixed method was effective, enabled the researcher to gain rich information regarding SIDS understanding among neonatal healthcare providers in Jordan, and their practical ability to educate families regarding SIDS prevention. Furthermore, the neonatal healthcare providers had enjoyed participating in this kind of research approach, as it gave them a chance to express the lived working experience, challenges and their suggestions reduce SIDS in Jordan via focus group participation. Furthermore, adapting the BCT helped the researcher to meet the study goal and implement an effective change in the practice among hospital's staff.

In this study, the researcher used education strategies that maximised the study benefits and minimised challenges and distractions to Jordanian cultural norms, accepted work practices, study commitments and continuing professional development programs. Involving hospital key-stakeholders was an effective BTS preparation strategy, which helped in investigating problems and devising solutions to improve infant health care practice in the healthcare setting. Key-stakeholders played a major role supporting the researcher in investigating all possible avenues for implementing the JSEP; investigating opportunities and ways for participants to effectively communicate SIDS-prevention messages to families; assessing the challenges of implementing the JSEP. Involving the stakeholder in the planning and implementing the JSEP, enabled the researcher to provide strategies and schedule the implementation of the JSEP which met the project's objectives and timeframes and fitted in with the hospital staff's commitments. In addition, involving the stakeholders helped to both implement and keep the change progressing in the future and reduce relapse into old practices.

The train-the-trainer approach was another effective strategy was used in this study. This was effective in terms of time, cost effectiveness and ongoing sustainability. The volunteer trainers helped the researcher in educating the neonatal healthcare providers at the hospital. In addition, having the volunteer group maintained and stabilised the change in practice among the neonatal healthcare providers, as this group during course of the normal duties, providing regular support to neonatal healthcare providers, taught the SIDS education to new staff. In

addition, they provided information to existing staff and were regarded as positive role models. This group also helped the researcher to keep abreast of progress in SIDS education. Without the involvement of volunteer trainers and multiple discussion sessions, the researcher would have been unable to educate all the staff in the targeted units within the study timeframe and would have struggled to achieve the study aims.

Targeting one major hospital is also a very significant strategy used in this study. This facilitated the development and implementation of an effective intervention. Targeting one main hospital is much valid for time management and accessing the participants. Targeting one major hospital also enabled the researcher to have the benefits of being familiar with the hospital and enabled better access of the hospital resources to support the fulfilment of the research goals. Conducting the research in a one hospital setting also made it easier for the researcher to be aware of how the study and the JESP intervention was progressing. It also enabled the researcher to have more data collection strategies such as, observations, questionnaires and focus groups and achieved rich information about neonatal healthcare providers regarding knowledge and practice for SIDS prevention and met the study goal. This positive engagement will helps to introduce greater knowledge about SIDS in Jordan and in the Middle East. Thus, this study provided baseline data for further development of SIDS education package for other healthcare settings and institutions in Jordan, as well as in other Middle Eastern countries.

This hospital-based intervention created a ripple of change by investigation the effectiveness of development and implementing a SIDS intervention program in Jordan. It investigated the challenges and future direction for improving the intervention to have bigger program within Jordan.

4.23 STUDY LIMITATIONS

Targeting one major hospital is very significant strategy used in this study and it is questionable that a larger study could have been sustained. However, targeting other healthcare settings in rural and regional areas in Jordan, would have added an extra dynamic to this study. The researcher found difficulty in including all healthcare provider trainees in the JSEP, especially those attending medical school, as they were often unavailable do to having various training programs exams. This group also had various clinical training hours and multiple rotations during the academic semester, which added extra difficulty in

including them in the intervention program. It would be beneficial in future to targeted trainees in their health institution education settings in the future. Additional support from the teachers in these institutions, both to ensure that SIDS prevention content is delivered, but also to assist as trainers, will be important in future developments of this initiative. Furthermore, no data has been collected from families, because of time limitation and the available cost of the study. The families' attitudes and challenges will clearly impact upon the successful translation of this program into practice in the homes. It is therefore unknown if this study will have an impact upon the incidence of SIDS in Jordan, rather it is intended to provide an early base for future interventions that will extend beyond the health care setting.

4.24 STUDY IMPLICATIONS

This study, that made a significant contribution to healthcare education and infant care practice in one hospital in Jordan, will hopefully provide direction to help reduce SIDS risk in this challenging environment. This project can be further developed and replicated within different healthcare settings, to improve infant health care knowledge, change behaviour, and improve skills among healthcare providers. This needs to be achieved by creating links between researchers, health practitioners, trainers, hospital key-stakeholders, managers and policy makers in order to ensure that the will, resources and policies exist to enable such an important endeavour. This study also provided a sound literature base and highlighted SIDS risks in Jordan, with the objective of turning the evidence based knowledge about SIDS into action. The knowledge that was gained from the process of developing and implementing the JSEP at one major hospital in North Jordan has potential value to provide a stimulus to further develop the JSEP to spread this new knowledge in other locations throughout Jordan and other Middle Eastern countries.

Nursing and midwifery practice in 2014 is not only about providing the current level of healthcare service, it is also about getting the accurate healthcare knowledge in a way that considers all factors that may impact on healthcare practices. Healthcare providers need to be aware of the sensitive cultural aspects associated with healthcare practices in their community in order to be effective. As discussed in chapter one, the Jordanian community is unique in its structure, and includes people from different Middle Eastern countries such as Iraq, Syria, and Palestine, all whom are living in Jordan and have similar beliefs, norms, traditions and culture. In this project, great care was taken to ensure cultural sensitivity was paid to bringing Western practices into an Eastern healthcare setting. It is important to be aware about the

physical, emotional social, spiritual, environmental and economic aspects that influence the infant care practice in Jordan, and this study did this by ensuring local people were the instigators of change. This positive engagement will help to introduce greater knowledge about SIDS in Jordan and in the Middle East area. The study unexpectedly also highlighted area of high demand in infant care which will provide challenges to implementing changes in modifying risky behaviours related to SIDS. These challenges are associated with the cultural needs of the community, but also provide opportunities for future developments to ensure that the necessary cultural changes are made if required to reduce risky behaviours for infant care practice. There is even the potential that if cultural practices such as smoking in the home are challenged due to a wish to ensure a safe environment for newborns, that this may also result in a wider raised awareness of the impact of smoking on all family members.

4.25 FUTURE RESEARCH AND RECOMMONDATIONS

More research is needed to explore infant care practices and home environment among families in Jordan, especially for high risk groups. Future work should also consider the ongoing impact of this intervention on practices among families who were exposed to the education intervention during the study period. Development of special SIDS education program is substantial needs in Jordan, to target refugees, Bedouin, and Curl families, living in rural, desert and highland areas as they were defined as a high risk group.

SIDS awareness and teaching practices need to be evaluated among neonatal healthcare providers in other healthcare settings in Jordan. SIDS-education needs to be spread to healthcare providers in other healthcare settings. In future, it would be beneficial to compare SIDS awareness and teaching practices in Jordan with other Middle East countries.

Future research will need to explore parents' beliefs regarding smoking risks impacted on infant health, and their attitudes towards keeping homes free smoke. Further investigation will required for cultural aspects in Jordan and how instrument both culture and religion could change parents' and their families' behaviours to reduce the risk of SIDS.

In Jordan, SIDS research needs to be considered, investigation for incidence of SIDS and unexpected death and meet families having these cases. Further investigation needs for Jordanians' homes to evaluate indoor air quality, especially in winters. Investigations need for unexpected deaths among children in Jordan, and especially for these cases occur in

winters, and in particular for cases occur to infants of families' living in such rural, highlands or desert areas, where they identified as high risk groups. Should also enhance the diagnosis process for infant deaths in Jordan, and discover SIDS cases.

4.26 CONCLUSIONS

Overall, the results and findings met the research goals and were consistent with the conceptual framework. Some results of this study were also consistent with those of previous studies conducted in the developed countries, which provided SIDS education. The study undertaken for this dissertation, as far was the first time a SIDS education package has been implemented in Jordan.

Prior to development and implementation of the JSEP, the baseline observation for current infant sleeping positions found no healthy and medically stable infants were placed in prone positions at all, unlike studies conducted in developed countries. This related to hospital positioning policy for medically stable infants in open cots and the dominant Jordan's culture as discussed in the introduction, that Jordanians have a common beliefs that sudden death is associated with prone position. This is accurate practice to reduce SIDS risk, however, around half of observations were healthy and medically stable infants placed on a side sleeping positions, and this was not considered problematic by the neonatal healthcare staff or the infants' families, despite the literature demonstrating that side sleeping increases the risk of SIDS. In addition, most of study's neonatal healthcare providers indicated that they rarely provided any SIDS education to parents and caregivers. They also lacked any understanding of accurate SIDS risks and prevention practices. Neonatal healthcare providers indicated that they often felt less confidence regarding provide the SIDS prevention advice. They also lacked appreciation of their role in reducing the incidence of SIDS through clinical practices such as infant sleeping positions and by teaching parents and caregivers.

Overall the study findings indicated that implementation of the SEP in Jordan was effective and feasible. The quantitative study results indicated statistically significant improvements not only self-reported knowledge and perceptions regarding SIDS risk prevention and educating family practices, but also independently observed SIDS safe positioning practices for healthy and medically stable infants in neonatal cots. The qualitative outcomes of the implementing the JSEP included positive perceptions and increasing confident of study participants to provide the accurate SIDS-prevention advice. All focus groups indicated a

move from perceiving themselves as having a ‘passive role’ with regard to SIDS risk prevention to having an ‘active role’. Neonatal healthcare providers who work and train at KAUH are apparently continuing to change infant care practice amongst themselves and families they are for.

A number of challenges to the SIDS education have been found in Jordan. Challenges identified by hospital healthcare providers when providing parents with SIDS education included noisy work environments, time limitations, staff shortages, and opposition to cultural beliefs.

Not only were the community circumstances and population characteristics identified adding to the challenges for the Jordanian healthcare providers but the content itself also challenged their own beliefs and practices SIDS-safe infant sleep care, or having a SIDS-safe home environment themselves. Factors influencing infant care practices in Jordan are culture, economic, climate and education background. These culminate to form a very challenging situation in addressing the high incidence of SIDS in Jordan.

The main concerns around SIDS risk-prevention in Jordan are the risks relating to infant sleep care practices, home environments, high risk groups, and families’ awareness regarding current risks. In addition to the information provided by this study into hospital practices, further investigation is required into the infant care practices and the home environment in Jordanian households. Local media need to be involved in SIDS education, health care providers’ need to be aware regarding their role in educating parents and caregivers in their healthcare settings, as well as in their homes and surrounding community. In Jordan, SIDS research needs to be considered, investigation for incidence of SIDS and unexpected death and meet families having these cases.

Change can be likened to a pebble in a pond. A small dropped into a large pond can have a significant impact and enhance the knowledge and practice regarding SIDS risk prevention among the staff in one hospital. If this change is repeated in several places throughout the country, it will become part of everyday knowledge for all health professionals, who will in turn teach many new parents. One day, the introduction of SIDS education in the KUAH may be acknowledged as the beginning of SIDS prevention in Jordan.

Appendix 1: Infant Sleeping Observation Form

INFANT SLEEPING POSITION OBSERVATION FORM
KING ABDULLAH UNIVERSITY HOSPITAL (KAUH)

Exploring the Impact of Implementing an Education Package for Sudden Infant Death Syndrome on the Knowledge and Practice of Jordanian Nurses and Midwives

Investigator: Hamadneh, Sh.
Edith Cowan University, Western Australia.

Hospital unit:

Infant code:

ISP ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO**	**ISP** ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO** .....
ISP ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO**	**ISP** ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO** .....
ISP ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO**	**ISP** ❑ Supine ❑ Side ❑ Prone	**Shift** ❑ D ❑ N	**DOO** .....

Gender: M=Male, F=Female; Date of Birth (DOB); DOO: Date of Observation; Infant sleep position (ISP): Infant Sleep Position, Shift: D= Day, N= Night.

Appendix 2: ISPQ

Infant Sleep Positioning Questionnaire: Post-test

1) In which position do you usually place medically stable premature infants who are in open cribs for sleep? Medically stable is defined as no higher than low flow nasal cannula, feeding > half of feedings by breast or bottle)

a) Prone
b) Side or prone
c) Supine
d) Side
e) Side or supine
f) All positions (prone, side, supine)

2) Which factors influence your assessment of proper sleep position for medically stable infants? (select all that apply):

a) Respiratory (improved oxygenation, comfort breathing, lung mechanics)
b) Developmental (facilitate neuromuscular development, improved quality of sleep, organizational development/stress reduction, comfort)
c) Less apnea/bradycardia
d) Per positioning policy
e) Airway patency (reduces risk of choking)
f) Reduces risk of SIDS
g) Role model / transition infant for home sleep positioning

3) In which medical condition or circumstance would the supine sleep position be contraindicated? Please select all that apply:

a) Gastro-esophageal reflux
b) Upper airway anomalies that cause obstruction in supine position (i.e. Pierre-Robin syndrome)
c) Chronic lung disease, oxygen dependent
d) If infant needs a cardio respiratory home monitor
e) Severe life threatening reflux
f) When sleep is adversely affected (infant prefers another position for sleep, or infant is irritable or inconsolable)
g) There are no exceptions

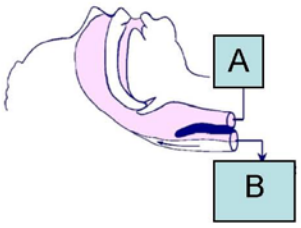
4) The Amarican Academy of Pediatrics (AAP) recommended supine position for healthy **preterm** infants to reduce the risk for SIDS. What is your opinion of this recommendation?

a) Strongly agree
b) Mildly agree
c) Neither agree or disagree
d) Mildly disagree
e) Strongly disagree

5) If you answered either a or b in Question 4, go directly to question 6. If you disagreed with the recommendation in question 4, please state your reason(s) by selecting all that apply).

a) Supine positioning increases the risk for aspiration in premature infants
b) Supine positioning alters quality of sleep in premature infants
c) Premature infants have more reflux in supine position
d) Supine position is not optimal for the developmental needs of premature infants
e) Supine position causes nonsynostotic plagiocephaly (flat heads)
f) Other_____

6) Which is the trachea? "A" or "B" ____.



The following question is about anticipatory guidance (discharge teaching) that is given to parents of infants being discharged from the level 2 and higher nurseries in your hospital.

7) How often do you give information about SIDS risk and risk reduction when infants are discharged from the level 2 -4 nursery in your hospital?

a) Always
b) Usually
c) Sometimes (50% of the time)
d) Rarely
e) Never

The following questions are about your experiences in giving discharge instructions to parents in the level 2 and higher nursery.

8) At the time of discharge from the level 2 -4 nursery, which of the following most closely resemble how you instruct parents to position term and preterm infants for sleep (select all that apply):

a) Place infant on back to sleep
b) Place infant either on side or back to sleep
c) Place infant on side with positioning rolls for sleep
d) Place infant on stomach (prone) to sleep
e) Place infant in whatever position the infant appears most comfortable sleeping
f) I give written instructions but do not discuss sleep position with parents
g) I don't give instructions regarding sleep position
h) Other_____

9) When discharging infants from the nursery, what advice do you give parents with regards to bed sharing? (Select all that apply)

a) Its ok to share a bed with an infant
b) It is ok to share a bed with an infant if there is nowhere else for the infant to sleep (there is no crib, bassinet, available etc.)
c) It is ok to share a bed with an infant if bed sharing makes it more convenient to breastfeed during the night
d) It is ok to share a bed with an infant if there is concern that the infant may become sick or have trouble breathing at night
e) It is ok to share a bed with an infant if this allows the parent(s) to bond with the infant
f) It is ok to share a bed with an infant if bed sharing is family custom or tradition
g) It is ok to share a bed with an infant for a short period of time (time between early morning feeding and regular waking time for example)
h) I don't give instructions regarding bed sharing
i) It is best not to bed share

10) How often do you discuss discharge instructions with the following individuals in addition to the mother? Please circle one answer choice for each individual listed.

Father	Usually	Sometimes	Rarely	Never
Grandparent	Usually	Sometimes	Rarely	Never
Other extended family member	Usually	Sometimes	Rarely	Never
Foster Parent	Usually	Sometimes	Rarely	Never
Other	Usually	Sometimes	Rarely	Never

11) Soft objects such as pillows, stuffed toys, quilts and bumper pads are often gifts that parents receive for their babies. When discharging infants from the level 2 and higher nursery, what do you tell parents about the safety of the infant sleeping with the following objects (check one answer for each object):

Object	**Safe**	**Somewhat safe**	**Not safe**	**No opinion**	**Don't discuss**
Blankets					
Pillows					
Sheepskin					
Bumper pads					
Stuffed animals					
Quilts					
Wedges					

12) When discharging an infant, what advice do you give parents regarding pacifier use? (Select all that apply)

a) I do not recommend putting the infant to sleep with a pacifier
b) Once breast feeding is well established, I recommend putting the infant to sleep with a pacifier
c) I only recommend a pacifier for infants that will be bottle fed at home
d) I do not give advice regarding pacifier use
e) I always recommend a pacifier be offered to infants at sleep time

13) At the time of discharge, what instructions do you give parents regarding maintaining the infant's temperature (select all that apply):

a) I instruct parents to monitor the infant's temperature regularly
b) I instruct parents to swaddle their infant
c) I instruct parents to use additional blankets and or hats if needed to maintain their infant's temperature during sleep
d) I instruct parents to keep the room temperature so that an adult can sleep comfortably in light clothing and dress their infant the same
e) I instruct parents to sleep with their infant to help maintain body temperature
f) I do not give advice regarding maintaining the infant's temperature

14) The American Academy of Pediatrics (AAP) recommendations for SIDS risk reduction were released in November 2005?
Have you… (select all that apply):

a) Read the recommendations
b) Heard about the recommendations from professional colleagues
c) Heard about the recommendations from the news media
d) Seen an overview of the recommendations
e) Not read the recommendations
f) Not heard about new recommendations

15) What is your typical source of information on SIDS risks and recommended reduction measures? (select all that apply)

a) Mass media
b) Colleagues
c) Meetings/Speakers
d) Hospital continuing educational programs
e) Professional journals
f) Little information was provided on these topics in sources listed above

16) How safe is it for a baby to sleep on his stomach?

a) It is very safe
b) It is not very safe
c) I don't know
d) It is kind of safe
e) It is not safe at all

17) How safe is it for a baby to sleep on his side?

a) It is very safe
b) It is not very safe
c) I don't know
d) It is kind of safe
e) It is not safe at all

18) How safe is it for a baby to sleep on his back?
a) It is very safe
b) It is not very safe
c) I don't know
d) It is kind of safe
e) It is not safe at all

19) Please indicate your level of agreement
SA- Strongly Agree **A**-Agree **N**-Neutral
D-Disagree **SD**-Strongly Disagree NO- No Opinion

Supine sleeping is safer than side sleeping for lowering the risk of SIDS	**SA**	**A**	**N**	**D**	**SD**	**NO**
Infants should be sleep close to parents, but in a separate space (crib or bassinet).	**SA**	**A**	**N**	**D**	**SD**	**NO**
All soft objects (pillows, blankets, stuffed animals) should be removed from the infant's sleep environment during sleep	**SA**	**A**	**N**	**D**	**SD**	**NO**
Infants should be given a pacifier when they are put to sleep	**SA**	**A**	**N**	**D**	**SD**	**NO**
Infants should be clothed so they are warmer compared to adults in the same room.	**SA**	**A**	**N**	**D**	**SD**	**NO**
An infant who is placed on his stomach to sleep when he normally sleeps on his back is at increased risk of SIDS	**SA**	**A**	**N**	**D**	**SD**	**NO**
Home apnea monitors reduce the risk of SIDS	**SA**	**A**	**N**	**D**	**SD**	**NO**
Smoking in the infant's home environment increases the risk of SIDS.	**SA**	**A**	**N**	**D**	**SD**	**NO**
Breastfeeding helps reduce the risk of SIDS.	**SA**	**A**	**N**	**D**	**SD**	**NO**

20) How many years have you worked in a level II or higher nursery? ____ (years)

21) Are you ? a) Male b) Female

22) Age
a) 19-24 years
b) 25-30 years
c) 31-36 years
d) 37-42 years
e) 43-48 years
f) 49-54 years
g) 55-65 years
h) > 65 years

23) Are you
a) Caucasian
b) African American
c) Asian
d) Native American
e) Hispanic
f) Other (please specify) _____

24) Have you or someone that you know lost an infant to SIDS? Yes ___ No ___

If yes, what was your relationship to infant

_____

Did you provide grief support? Yes____ No ___

25) Have you participated in a SIDS risk reduction class in the last three years? Yes ___ No___

26) Where do you work? (please select one)
a) Grady Health System
b) Medical College of Georgia
c) Dekalb Medical Center
d) Children's Hospital at Egleston
e) Southern Regional Medical Center
f) Atlanta Medical Center
g) Other _____

27) Survey ID Number: What are the last 4 digits of your home phone # _____

28) Most of the time, what shift do you work?
a. ___ 7AM to 7PM
b. ___ 7AM to 3PM
c. ___ 3PM to 11PM
d. ___ 11PM to 7AM
e. ___ 7PM to 7AM

29) Highest level nursing degree:
a) Doctorate
b) Masters
c) Baccalaureate
d) Associate
e) Diploma
f) LPN
g) Other_____

Appendix 3: Modified ISPQ

PRE/POST TEST FOR SIDS KNOWLEDGE & RELEVENT PARENTAL/FAMILY INSTRUCTION PRACTICES (MODIFIED ISPQ)

The following questions are about <u>your experiences</u> in giving instructions about sleeping styles and environment for healthy, medical stable infant , with parents you meet in hospital when infants discharging or with parents you meet in your daily life.

1) How often do you give information about SIDS risk and prevention strategies?
    a. Always
    b. Usually
    c. Sometimes (50% of the time)
    d. Rarely
    e. Never

2) Which of the following most closely resemble how you instruct parents to position term and preterm infants for sleep (select one choice)
    a. Place infant on back to sleep
    b. Place infant either on its' side or back to sleep
    c. Place infant on side with positioning rolls for sleep
    d. Place infant on stomach (prone) to sleep
    e. Place infant in whatever position the infant appears most comfortable sleeping
    f. Mix of the above A-E. Please indicate.....
    g. I don't give instructions regarding sleep position

3) What advice do you give parents with regards to bed sharing? (select one choice)
    a) It is ok to share a bed with an infant
    b) It is ok to share a bed with an infant if there is nowhere else for the infant to sleep (there is no crib, bassinet, available etc.)
    c) It is ok to share a bed with an infant if bed sharing makes it more convenient to breastfeed during the night
    d) It is ok to share a bed with an infant if there is concern that the infant may become sick or have trouble breathing at night
    e) It is ok to share a bed with an infant if this allows the parent(s) to bond with the infant
    f) It is ok to share a bed with an infant if bed sharing is family custom or tradition
    g) It is ok to share a bed with an infant for a short period of time (time between early morning feeding and regular waking time for example)
    h) Mix of the above advice A-G .Please indicates.....
    i) I don't give instructions regarding bed sharing
    j) It is best not to bed share

4) What advice do you give parents regarding pacifier use? (select one choice)
    a. I always recommend a pacifier be offered to infants at sleep time
    b. Once breast feeding is well established, I recommend putting the infant to sleep with a pacifier
    c. I only recommend a pacifier for infants that will be bottle fed at home
    d. I do not give advice regarding pacifier use
    e. I do not recommend putting the infant to sleep with a pacifier

5) What instructions do you give parents regarding maintaining the infant's temperature (select one choice):
    a) I instruct parents to swaddle their infant
    b) I instruct parents to use additional blankets and or hats if needed to maintain their infant's temperature during sleep

c) I instruct parents to keep the room temperature so that an adult can sleep comfortably in light clothing and dress their infant the same
d) I instruct parents to sleep with their infant to help maintain body temperature
e) Mix of the above A-D. Please indicate.....
f) I do not give advice regarding maintaining the infant's temperature

6) What advice do you provide about the safety of presence the following objects in infant's bed (check only one answer for each object)

Object	**Safe**	**Somewhat safe**	**Not safe**	**No opinion**	**Don't discuss**
1. Blanket					
2. Pillow					
3. Sheepskin					
4. Bumper pad					
5. Stuffed animal					
6. Quilt					
7. Wedge					

7) . What is the proper sleep position for **<u>healthy term</u>** infant: (select one choice)
a. Supine
b. Supine or Side
c. Side
d. Prone
e. Prone or Side
f. All positions (prone, side, supine)

8) How safe is it for a baby to sleep on the following positions? (Only one answer for each)

Safety / Position	It is very safe	It is kind of safe	don't know	It is not very safe	It is not safe at all
1. Stomach (prone)					
2. Lateral (side)					
3. Back (supine)					

9) Please indicate your level of agreement with the following statements. (Only one answer for each) **SA**= Strongly Agree, **A**= Agree, **N=** neither agrees nor disagrees, **D=**Disagree, **SD**= Strongly Disagree.

1. Infants should be sleep close to parents, but in a separate space (crib or bassinet).	**SA**	**A**	**N**	**D**	**SD**
2. All soft objects such as pillows, blankets, and quilts should be removed from the infant's sleep environment during sleep	**SA**	**A**	**N**	**D**	**SD**
3. Infants should be given a pacifier when they are put to sleep	**SA**	**A**	**N**	**D**	**SD**
4. Infants should be clothed so they are warmer compared to adults in the same room.	**SA**	A	**N**	**D**	**SD**
5. Smoking in the infant's home environment increases the risk of SIDS.	**SA**	**A**	**N**	**D**	**SD**
6. Breastfeeding helps reduce the risk of SIDS.	**SA**	**A**	**N**	**D**	**SD**

10) If you not recommended using supine position for healthy **preterm** infants to reduce the risk of SIDS, please state your reason(s). (select one choice)

a) Supine positioning increases the risk for aspiration in premature infants
b) Supine positioning alters quality of sleep in premature Infants.
c) Premature infants have more reflux in supine position
d) Supine position is not optimal for the developmental needs of premature infants
e) Supine position causes nonsynostotic plagiocephaly (flat heads)
f) More than reason of the above, please indicated_____
g) I recommend using supine position

11) The American Academy of Paediatrics (AAP) released recommendations for SIDS risk reduction. Have you…? (select one choice):
a) Read the recommendations
b) Heard about the recommendations
c) Seen an overview of the recommendations
d) All of the above
e) Mix of the above resources A- C. Please indicate.....
f) Never known about these recommendations

12) What is your typical source of information on SIDS risks and prevention strategies? (select one choice):
a) Mass media
b) Colleagues
c) Meetings/Speakers
d) Hospital continuing educational programs
e) Professional journals
f) All of the above
g) Mix of the above resources A- E. please indicated.....
h) Never access any information resources about this topic

13) Have you ever received an education about SIDS risk reduction?
    a. Yes, when..... where.....
    b. No
14) Have you filled this survey before this time (The Pre-test)?
    a. Yes, please indicate the previous survey's reference number.....
    b. No

15) In which unit you are working/training?
    a. NICU
    b. Nursery
    c. Labour Unit
    d. Antenatal word
    e. Postnatal word
    f. Paediatrics clinics
    g. Maternity clinics

16) How long have you been working/ training in this unit?
    a. Less than 2 year
    b. 2-5 years
    c. More than 5 years

17) What is your most common shifts:
    a. Day shifts
    b. Night shifts
18) Could you please specify your gender?
    a. Male
    b. Female

19) In which capacity you work in the health institution?
    a. A midwife
    b. A practical nurse
    c. An associated nurse
    d. A registered nurse
    e. A bachelor nursing or midwifery student
    f. A master nursing or midwifery student

20) Which highest education degree you have completed or undertaking?
    a. Postgraduate degree
    b. Baccalaureate degree
    c. Associate or Diploma degree

21) Please, choose your range of age:
    a. 20-25 years
    b. 25-30 years
    c. 31-35 years
    d. 36-45 years
    e. 45-50 years
    f. More than 50 years

Thank you for participating in this study

Appendix 4: Focus Group Scripted Questions

Do you think your role regarding SIDS risk reduction has been changed? How? What are the best examples to illustrate how you are playing an active role in SIDS prevention?
Are there any challenges or limiting factors in communicating SIDS prevention messages to parents and caregivers? How do you manage these factors? What challenge is the most difficult to overcome?
What strategies have you found to be the most effective for enhancing your knowledge on SIDS prevention at this time? And why?
What strategies have you found to be the most effective for enhancing parents' knowledge of SIDS prevention at this time? And why?
Considering your experience of this program, do you think the SIDS educational package was effective?

Appendix 5: Focus Group Information Sheet

FOCUS GROUPS PARTICIPANT INFORMATION SHEET

KING ABDULLAH UNIVERSITY HOSPITAL (KAUH)

Exploring the Impact of Implementing an Education Package for Sudden Infant Death Syndrome on the Knowledge and Practice of Jordanian Nurses and Midwives

Investigators: Hamadneh, Sh.
Edith Cowan University, Western Australia.

Please take time to read the following information. Don't hesitate to contact us if you have any question, if some part of the information is not clear to you or if you would like more information.

For any queries, please contact: Shereen Hamadneh; Shamadne@our.ecu.edu.au;
Shereen_hamadneh@yahoo.com; Tel: 02-7200600Mobile: 0787213834

All study participants will be provided with a copy of the Information Sheet and Consent Form for their personal records. If you decide to take part in this study, you may stop at any time. Whatever your decision, this decision will not lead to any penalty or affect your work.

Study purpose: The purpose of this study is to explore the impact of develop and implement of a sudden infant death syndrome (SIDS) education package on the knowledge and practice of Jordanian nurses, midwives, and nursing students. Further, the overall goal of this study is to influence lifestyles and infant care practices in Jordan to reduce the incidence of SIDS.

The study objectives are to:

1. Develop a SIDS education package using current evidence of best practice, tailored for the Jordanian context.
2. Present the Jordanian SIDS Education Package (JSEP) to a sample of nurses, midwives and nursing students at a major hospital in Jordan.
3. Assess the impact of the JSEP in terms of the knowledge and practice of Jordanian nurses and midwives by measuring the knowledge levels before, and eight months after, implementation of the JSEP (quantitative assessment).
4. Explore the participants' attitudes and experiences towards the newly developed JSEP (qualitative assessment).

This study is suitable to you: This project will provide important health benefits, in terms offer opportunities for participants to improve their knowledge on SIDS prevention, infant nursing practices and commuinication skills with SIDS prevention strategies. Your participation in this study will involve a focus group discussion after the implementation of the Jordanian SIDS education package (JSEP). This focus group will take place at a

time and location convenient to you. The focus group will be tape-recorded. We may need to contact you following this focus group for further questions over the telephone or by email.

The order and content of the focus group will be: (1) Study background and introduction (2) Explanation of the study purpose. (3) Explanation of the main topics which will be covered. (4) Ethical considerations (5) Explanation of the purpose of recording the session.

The objectives of the focus group

1. Clarify the common findings of the pre-post-test questionnaire.
2. Assess participants' perception of undertaking this experience and their recommendations.
3. Investigate ways that can effectively help for further developing of the JSEP in the future.
4. Suggest further ways that participants can effectively communicate SIDS prevention messages to parents.
5. Assess the challenges to implementing the JSEP.

Focus group session long: Participation in each session will take 60-90 minute of your time.
Cost associated to participate in this study: There are no costs associated with participating in this study.

Possible benefits of taking part: Participation in this focus group will give you an opportunity to describe your experience of SIDS prevention. By participating in this study you will be contributing to improvements in the future infant care practice.

Possible side effects, risks and discomforts of taking part: The only possible discomfort involved with your participation in this study is that you may become distressed whilst being interviewed. If you experience this you may ask for the tape-recorder switched off and/or the interview to be discontinued.

Consent to participate: Your involvement in this research is entirely voluntary. You have the right to withdraw at any stage without it affecting you in any way. By signing the consent form, I assume that you have agreed to participate and allowed me to use the information you provide unless you decide to withdraw, or to withhold any information.

Confidentiality: The information you provide in the interview will be anonymous. Identifying information such as your personal details will not be used. Otherwise, your records obtained while you are in this will remain strictly confidential at all times. Your consent form and information transcribed from the interview will be kept in a locked cabinet for at least five years, at which time it will be shredded. This process of confidentiality is in accordance with Edith Cowan University policy.

Ethical consideration: This research has been reviewed and given approval by IBR Ethics Committee at KAUH as well as it has been approved from ECU Human Research Ethics Committee.

Participant Name: _____

Phone Number_____

Signature: _____

Date: _____

In anticipation, thank you for your willingness to be involved in this research. Your participation is highly appreciated

Appendix 6: Questionnaire Completion Information Sheet

PRE/POST TEST QUESTIONNAIRE COMPLETION INFORMATION SHEET
KING ABDULLAH UNIVERSITY HOSPITAL (KAUH)

Exploring the Impact of Implementing an Education Package for Sudden Infant Death Syndrome on the Knowledge and Practice of Jordanian Nurses and Midwives

Investigator: Hamadneh, Sh.,
Edith Cowan University, Western Australia.

Please take time to read the following information. Don't hesitate to contact us if you have any question, if some part of the information is not clear to you or if you would like more information.

For any queries, please contact: Shereen Hamadneh; Shamadne@our.ecu.edu.au or Shereen_hamadneh@yahoo.com; Tel: 02-7536068; Mobile: 0787213834

All study participants will be provided with a copy of the Information Sheet and Consent Form for their personal records. If you decide to take part in this study, you may stop at any time. Whatever your decision, this decision will not lead to any penalty or affect your work.

Study purpose: The purpose of this study is to explore the impact of develop and implement of a sudden infant death syndrome (SIDS) education package on the knowledge and practice of Jordanian nurses and midwives. Further, the overall goal of this study is to influence lifestyles and infant care practices in Jordan to reduce the incidence of SIDS.

The objectives are to:

1. Develop a SIDS education package using current evidence of best practice, tailored for the Jordanian context.
2. Present the Jordanian SIDS Education Package (JSEP) to a sample of nurses, midwives and nursing students at a major hospital in Jordan.
3. Assess the impact of the JSEP in terms of the knowledge and practice of Jordanian nurses and midwives by measuring the knowledge levels before, and three months after, implementation of the JSEP (quantitative assessment).
4. Explore the participants' attitudes and experiences towards the newly developed JSEP (qualitative assessment).

This study is suitable to you: This project will provide important health benefits, in terms offer opportunities for participants to improve their knowledge on SIDS prevention, infant nursing practices and commuinication skills with SIDS prevention strategies. Your participation in this study will involve a pre-post test infant sleep

practice questionnaire (ISPQ), in which you will be asked questions about your knowledge, experiences and thoughts in relation to SIDS prevention.

Cost associated to participate in this study: There are no costs associated with participating in this study.

Questionnaire completion long: Participation in each questionnaire will take 15 minute of your time.

Consent to participate: Your involvement in this research is entirely voluntary. You have the right to withdraw at any stage without it affecting you in any way. By signing the consent form, I assume that you have agreed to participate and allowed me to use the information you provide unless you decide to withdraw, or to withhold any information.

Confidentiality: The information you provide in the instrument will be anonymous. Identifying information such as your personal details will not be used. Your consent form and information transcribed from the instrument will be kept in a locked cabinet for at least five years, at which time it will be shredded. This process of confidentiality is in accordance with Edith Cowan University policy.

Ethical consideration: This research has been reviewed and given approval by IBR Ethics Committee at KAUH as well as it has been approved from ECU Human Research Ethics Committee.
If you would like further information about the research, please do not hesitate to contact me on my mobile phone: (0787213834) or by email: Shamadne@our.ecu.edu.au or Shereen_hamadneh@yahoo.com

Participant Name: _____
Signature: _____
Date: _____

In anticipation, thank you for your willingness to be involved in this research. Your participation is highly appreciated

Appendix 7: Focus Groups Participant Consent Form

FOCUS GROUPS PARTICIPANT CONSENT FORM

Exploring the Impact of Implementing an Education Package for Sudden Infant Death Syndrome on the Knowledge and Practice of Jordanian Nurses and Midwives

Investigators: Hamadneh, Sh.
Edith Cowan University, Western Australia.

Participant statement (Focus Groups)

I am ……(Print Full Name), I have read the information on the attached information sheet regarding this study titled: Exploring the Impact of Implementing an Education Package for Sudden Infant Death Syndrome on the Knowledge and Practice of Jordanian Nurses and Midwives. The nature, purpose and intent of this study have been explained to me as well as the requirements of participation.

I have also been informed where to direct any future questions. I also understand that I can withdraw at any time without explanation or consequences. I understand that my anonymity, privacy and confidentiality are guaranteed. I agree that discussion will be recorded and I voluntarily agree to participate in this study.

I am aware that information gathered from me for this study may be published and all names or any other identifying information will not be used.

Participant Name: _____
Phone Number_____
Signature: _____
Date: _____

For any queries, please contact the under-signed.
Yours sincerely, **Shereen Hamadneh:** Shamadne@our.ecu.edu.au; Tel: +96227536068

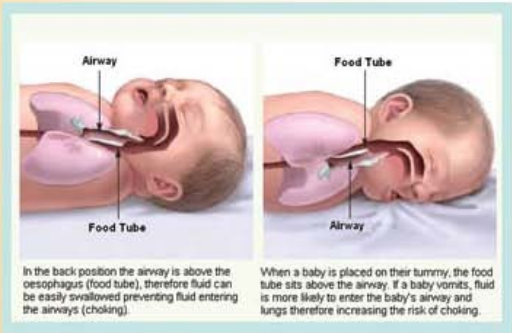
Appendix 8: Education Materials

sids and kids WESTERN AUSTRALIA

Why are the SIDS and Kids 5 safe sleeping recommendations so important?

1 Put baby on the back to sleep from birth

The chance of babies dying suddenly and unexpectedly is greater if they sleep on their tummies or sides.
Babies, who are placed on their tummy sleep more deeply, are less reactive to noise, experience less movement, and are less able to be aroused than babies who sleep on their back. All of these characteristics place an infant at a higher risk of SIDS. Healthy babies placed to sleep on the back are less likely to choke on vomit than tummy sleeping babies. In fact, **sleeping baby on the back actually provides airway protection**. The tummy position increases the risk of baby inhaling milk or fluids into their airway. Research shows, that all babies, including babies with reflux, should be placed on their back, and that there is no evidence to support the tilting of the head of the cot or elevating the mattress.



In the back position the airway is above the oesophagus (food tube), therefore fluid can be easily swallowed preventing fluid entering the airways (choking).

When a baby is placed on their tummy, the food tube sits above the airway. If a baby vomits, fluid is more likely to enter the baby's airway and lungs therefore increasing the risk of choking.

Some babies, with rare medical conditions, might have to sleep on the tummy or side but only do this if the baby's medical practitioner advises to do so in writing. The side position can increase the risk of SIDS as this position is unstable and encourages an infant to roll on their tummy. All aids and devices intended to keep infants in a certain sleep position do not prevent/reduce SIDS or prevent infants from rolling onto their tummy. Positional sleep devices are not recommended; they limit movement of the infant as they get older and have been linked to suffocation deaths.

2 Sleep baby with face uncovered

To avoid suffocation, airway obstruction and overheating ensure that baby's face and head stays uncovered during sleep.
The best way to achieve this is to use a baby sleeping bag. However, if you decide to use blankets ensure that the baby's feet are at the bottom of the cot, so that baby can't slip down under the blankets. Use lightweight blankets that can be tucked in securely. Soft items in a baby's sleeping environment can increase the risk of sudden unexpected infant death. It is best to remove quilts, doonas, duvets, pillows, cot bumpers, lambs wool and fluffy toys. They may cover the baby's face and obstruct breathing or cause overheating. Older babies in a cot can be at an increased risk of a sleeping accident by using pillows and bumpers as a step to climb up and fall out of the cot. It is safer to wait until the child starts to sleep in a bed before introducing a pillow or other soft bedding.

Baby on back,
Feet to bottom of cot.
Blankets tucked in firmly.

Use a safe sleeping bag with a fitted neck and armholes.

sids and kids WESTERN AUSTRALIA

3 Avoid exposing baby to tobacco smoke before birth and after

Babies who are exposed to tobacco toxins during pregnancy or after birth have a significantly higher risk of SIDS and the risk increases if a baby sleeps with a parent who is a smoker. These risks still remain even if parents smoke outside, away from their baby. **To reduce the risk of SIDS don't let anyone smoke near your baby – not in the house, the car or anywhere else that your baby spends time.**

4 Sleep baby in a safe cot, with a safe mattress and in a safe environment

Cots, mattresses and environments that are unsafe increase the risk of sudden unexpected infant death.

- *See Safety Tips for Infant Sleep*

5 Sleeping baby in a cot next to the parent's bed for the first six to twelve months

Sleeping with baby on the same sleep surface can increase the risk of sudden infant death and fatal sleep accidents. These risks include rolling on top of baby or adult body part obstructing babies airway, entrapment or wedging between the mattress and another object such as a wall, suffocation from pillows and blankets and overheating caused by adult and or infant bedding and adult body heat.

Safest place for baby to sleep is in a safe cot next to parent's bed.

SIDS and Kids recommends sleeping with baby in a cot next to the parent's bed for the first six to twelve months of life. Research in New Zealand and the UK has shown that sleeping baby in the same room, but not in the same bed, with the parents in the first six to twelve months of life is protective. This is thought to be because parents can see the baby and easily check to see that baby is safe. This protective effect does not work if the baby is in a room with other children probably because the children do not know if the baby is safe or not. Recent evidence from the UK indicates that sharing the same room during baby's daytime sleeps is also protective.

Never share a sleep surface with baby if you or your partner smokes, are under the influence of alcohol or drugs that cause sedation or are excessively tired. Babies must never be left alone on an adult bed or put to sleep on a sofa. There is a very high risk of infant death and sleeping accidents when a baby shares a sofa or couch with an adult during sleep.

Safety Tips for Infant Sleep

Bassinettes

There is no Australian Standard for bassinettes, unlike cots. We are aware of reports of accidents associated with bassinette use. Australian and US governments' guidelines on ways to reduce these types of accidents include:

- Ensure that it has a wide stable base and that it is placed on a stable surface.
- Remove all ribbons and ties to prevent strangulation
- The sides should be at least 300mm high measured from the top of the mattress base.
- Use a firm mattress that is a snug fit and is not thicker than 75mm.

ALERT: Make sure baby sleeps on the back with face uncovered. It may be better to use an infant sleeping bag when using a bassinette. Only use a lightweight blanket for additional warmth if it is possible to tuck blankets under the mattress.

Rocking Cradles

If you are buying a rocking cradle, make sure that it complies with the safety requirements of the voluntary Australian standard AS/NZS 4385. Look for a label or sticker that says the rocking cradle complies with this voluntary standard. If there isn't one, ask the retailer. If the retailer cannot verify that it complies, ask if there is an alternative that does comply.

Babies can become trapped in a tilted rocking cot or cradle. If you have a cradle or cot that rocks and has a child-resistant locking pin, make sure that you secure the locking pin firmly in place whenever you leave your baby and double check it make sure the cradle cannot move when you are not there to supervise.

Ensure the cradle has a tilt limiter to limit the angle of tilt to no more than 10 degrees from the horizontal.

Is it safe to use a secondhand mattress

There has been recent media attention in relation to a theory that there may be a link between SIDS and a certain bacteria found in second hand mattresses.

However, the bacteria in question are normally found on the skin and in the nose and throats of healthy adults and infants. There is no evidence to show that there is an increased risk of SIDS for babies who sleep on a second hand mattress providing that baby:

- Sleeps on the back.
- Sleeps on a flat, firm, clean, well fitting mattress that is in good condition.
- Sleeps with no bedding covering the face or head.
- Is not exposed to tobacco toxins before birth or after.

Is it safe to wrap/swaddle my baby?

Infant wrapping or sometimes called swaddling is a safe and effective strategy when trying to settle a baby to sleep on their back. However not all babies like to be swaddled, some swaddling products can be unsafe and wrapping techniques need to be modified to meet the baby's developmental changes. For example, a baby less than 3 months may have their arms included in the wrap whilst a baby more than 3 months of age may have their lower body wrapped with their arms free, to allow the baby access to their hands and fingers which promotes midline brain development.

0-3 months

3-6 months

If you choose to swaddle:

- Ensure that baby is positioned on the back with the feet at the bottom of the cot.
- Ensure that baby is wrapped from below the neck to avoid covering the face.
- Sleep baby with face uncovered (no doonas, pillows, cot bumpers, lambs wool or soft toys in the sleeping environment).
- Use only lightweight wraps such as cotton or muslin (bunny rugs and blankets are not safe alternatives as they may cause overheating).
- The wrap should not be too tight as this may interfere with physical development.
- Make sure that baby is not over dressed under the wrap. Use only nappy and Singlet in warmer weather and add a lightweight grow suit in cooler weather.
- Modify the wrap to meet the baby's developmental changes
- Discontinue wrapping when baby is able to turn onto the tummy during sleep.

ALERT: Caution must be taken with wrapping/swaddling products that restraint the infant and increase the risk of a sudden and unexpected infant death and fatal sleep accidents.

What do I do when baby starts to roll into the tummy position?

Most SIDS occurs under 6 months of age so try not to have baby sleep on the tummy before this time.

Most back-sleeping babies can't actually roll onto the tummy by themselves until about 5-6 months of age although a few can roll from a younger age. Babies who sleep on their back tend to roll onto their tummy later than side sleeping infants. This probably plays a part in why the back position is safer for babies as they do not roll into the high risk tummy position during a vulnerable period of development. The delay in rolling is normal and does not affect the baby's later development.

Steps to follow when babies start to roll on to the tummy:

- Give baby extra tummy time to play when awake and supervised as this helps baby to develop stronger neck and upper body muscles which in turn enables them to roll back over. It is best to start giving baby supervised tummy time from birth.
- Use an infant sleeping bag as these can delay rolling over.
- If you use blankets rather than a sleeping bag, make sure that the baby's feet are touching the bottom of the cot to prevent baby wriggling under the blankets and tuck the blankets in securely.
- Make sure that baby is on a firm and well fitting mattress that is flat (not tilted or elevated).
- Make sure that baby's face and head remains uncovered (avoid lambs wool, duvets, pillows, cot bumpers and soft toys)

As babies grow and develop they become very active and learn to roll around the cot. Put them on their back anyway but let them find their own position of comfort. Remember to reduce the risks in other ways.

What should I know about Infant Slings

Caution is advised when using infant slings as they pose a suffocation and injury risk. Slings are not recommended especially for babies younger than four months of age, babies of low birth weight, premature infants and babies with respiratory problems such as colds. Babies less than four months of age have weak neck muscles and are not able to control their heads.

A sling keeps the infant in a curled position bending the chin toward the chest, restricting the airway and limiting oxygen supply. The sling's fabric can press against an infant's nose and mouth blocking breathing. Injuries can also occur from baby falling from the sling if the parent trips or falls, the product malfunctions or its hardware breaks.

For more Safe Sleeping information go to www.sidsandkidswa.org or contact the SIDS and Kids WA Perth office on 9474 3544

Safety Tips for Infant Sleep

Hammocks

There is **no** Australian standard covering the use and manufacture of hammocks for baby.

While we are not aware of any research on the safety of hammocks or guidelines for their use for babies, we are aware of case and injury reports documenting a number of hospital admissions of infants following a fall from a hammock. Babies sleeping in hammocks are at risk of incurring a falling injury.

ALERT: Babies should not be left unsupervised in these devices as they are not designed as an infant sleeping place.

What is a Safe Cot?

Household Cots

A safe cot is one that meets the Australian Standard for cots. All new and second-hand cots sold in Australia must meet the Australian Standard for Cots (AS 2172) and will carry a label to say so.

If you are planning to use a second-hand cot, check that it meets those standards.

- The mattress must be flat and fit snugly to within 25 mm of sides and ends with the mattress base set in the lower position, the cot sides or end need to be at least 500 mm higher than the mattress.
- The spacing between the bars or panels in the cot sides and ends needs to be between 50 mm and 95 mm—gaps wider than 95 mm can trap a child's head. If the bars or panels are made from flexible material, the maximum spacing between the bars or panels should be less than 95 mm .
- Check that there are no small holes or openings between 5 mm and 12 mm wide in which small fingers can be caught.
- Check that there are no spaces between 30 mm and 50 mm that could trap your child's arms or legs.
- Check there are no fittings (including bolts, knobs and corner posts) that might catch onto your child's clothing and cause distress or strangulation.

ALERT: Old or second hand cots may be dangerous for the following reasons:

- *Wobbly or broken parts that make the cot weak.*
- *Gaps where a toddler or baby may get caught in.*
- *Knobs, corner posts or exposed bolts that can hook onto a toddler or baby's clothing around the neck.*
- *Sides that are too low and can be climbed over by active little toddlers.*
- *Sharp catches or holes in the wood that can hurt curious little fingers.*
- *Paint that might contain poisonous lead.*

Portable Cots

When assembling a portable cot it is important to read the instructions carefully, the instructions are there to help keep baby safe from sleeping accidents.

Only use the **firm**, thin, well-fitting mattress that is supplied with the portable cot (portacot). **Never** add a second mattress or additional padding under or over the mattress, which has been specifically designed for the portacot, as baby may become trapped face down in gaps between the mattress and the sides. Portacots have a different Australian Standard to cots. If you are buying a portacot, look for a model that meets the mandatory Australian Standard AS/NZS 2195 for portable cots.

- Look for a label or sticker that says the portacot complies with this mandatory standard.
- If you are accepting a second hand portacot ensure that the base is flat and that there is no torn mesh or broken parts.
- Regularly check the portacot for these signs of damage. Only use a portable cot that has the mesh in tact and that has no broken parts.
- Do not use bedding that has exposed elastic as this presents a strangulation hazard for baby.
- Do not use a portable cot if your child weighs more than 15kg (or check instructions of your particular model).

How much clothing/bedding does baby need?

Babies control their temperature through the face. Sleeping baby on the back and ensuring that the face and head remains uncovered during sleep is the best way to protect baby from overheating and suffocation. Sleeping baby in a sleeping bag will prevent bedclothes covering the baby's face.

If blankets are being used instead of a sleeping bag, it is best to use layers of lightweight blankets that can be added or removed easily according to the room temperature and which can be tucked underneath the mattress.

When dressing a baby you need to consider where you live, whether you have home heating or cooling and whether it is summer or winter. A useful guide is to dress baby as you would dress yourself – to be comfortably warm, not hot or cold. It is not necessary to leave the heating on all night or to monitor the room temperature with a thermometer, but ensure that baby is dressed appropriately for the room temperature.

A good way to check baby's temperature is to feel baby's chest, which should feel warm (don't worry if baby's hands and feet feel cool, this is normal).

Another way to prevent overheating is to remove hats or bonnets from baby as soon as you come indoors or enter a warm car, bus or train, even if it means waking the baby.

ALERT: Never use electric blankets, wheat bags or hot water bottles for babies.

sids and kids
WESTERN AUSTRALIA

Keep Head and Face Uncovered

Baby on back
Feet to bottom of cot
Blankets tucked in firmly

OR

Use a safe sleeping bag with a fitted neck and armholes

Covering baby's head or face increases the risk of SIDS

- ✓ Baby on Back
- ✓ Keep head and face uncovered
- ✓ Keep baby smoke free before birth and after
- ✓ Sleep baby in a safe cot next to parents' bed

Jointly developed by SIDS and Kids ACT, ACT Health and the Department of Disability, Housing and Community Services.

sids and kids

For further information talk to your doctor or child health nurse at your local Community Health Centre; call SIDS and Kids in your state or territory on

1300 308 307

or visit the SIDS and Kids website

www.sidsandkids.org

sids and kids

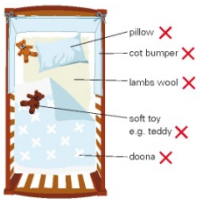
safe sleeping

Reducing the risk of Sudden Infant Death Syndrome (SIDS)

Sleep baby on back

Sleeping baby on the side or tummy increases the risk of SIDS

No Soft or Puffy Bedding

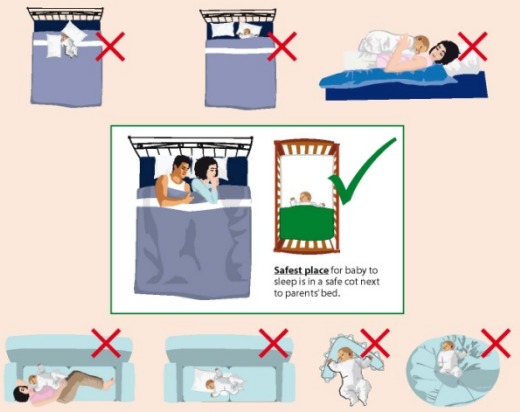


Cot should meet Australian Standard (AS2172)

Mattress should be firm and the right size for the cot

Soft surfaces increase the risk of SIDS

Unsafe Sleeping Places



Pictures with a **X** are **not** safe sleeping places

No smoking before or after birth

Smoking during pregnancy and around baby after birth increases the risk of SIDS.

Help to quit smoking is available from your doctor, nurse or by contacting

Quitline on 131 848

sids and kids safe sleeping

Information Statement

WRAPPING BABIES

WRAPPING IS A USEFUL STRATEGY THAT PARENTS CAN USE TO HELP THEIR BABIES SETTLE AND SLEEP ON THEIR BACK

To Reduce the Risks of SIDS, Sudden Unexpected Deaths in Infancy and Fatal Sleep Accidents

1. Sleep baby on the back from birth, not on the tummy or side
2. Sleep baby with face uncovered (no doonas, pillows, lambs wool, bumpers or soft toys)
3. Avoid exposing babies to tobacco smoke before birth and after
4. Provide a safe sleeping environment (safe cot, safe mattress, safe bedding)
5. Sleep baby in their own safe sleeping environment next to the parent's bed for the first six to twelve months of life

- Wrapping is a useful strategy that parents can use to help their babies to settle and sleep on their back, especially during the first 6 months of life
- Wrapping and placing babies on the back provides stability and helps to keep babies in the recommended back position
- When wrapping baby, allow for hip flexion and chest wall expansion and ensure baby is not over dressed under the wrap, has the head uncovered and does not have an infection or fever
- Babies must not be wrapped if sharing a sleep surface (including bed-sharing) with an adult
- Discontinue wrapping baby when baby is able to turn onto the tummy during sleep

---

Research has shown that one of the best ways to reduce the risk of SIDS and sudden and unexpected death in infancy is to sleep babies on their back. Managing unsettled infant behaviour and promoting sleep for babies, whilst ensuring that the safe sleeping recommendations are followed, is sometimes difficult for parents. Wrapping is a useful strategy that parents can use to help their babies to settle and sleep on their back, especially during the first 6 months of life.

Wrapping and placing babies on the back provides stability and helps to keep babies in the recommended back position[1-2]. Epidemiological studies have shown that being on the back and wrapped decreases the risk of SIDS more than being on the back without being wrapped[3]. Wrapping a baby also reduces crying time[4] and promotes sleep by lessening the frequency of spontaneous arousals[5-6]. However wrapping a baby does not influence breastfeeding frequency and duration and the amount of ingested milk[7]. Wrapping has also been shown to be effective in reducing a baby's response to pain, while preterm babies who are wrapped and placed on their back show improved neuromuscular development.[3]

Tummy sleeping increases the risk of sudden unexpected infant death and must be avoided. Wrapping a baby and placing them in the tummy position is even more dangerous as it prevents babies from moving to a position of safety[2,3].

Wrapping techniques that use tight wrapping with the legs straight and together have been associated with an increased incidence of abnormal hip development.[3,8] Other studies have linked tight chest wrapping with an increased risk for pneumonia[9], while some studies have indicated that overheating may occur if the baby is wrapped with their head covered or if the baby has an infection[3]. It is therefore important to allow for hip flexion and chest wall expansion when wrapping[2,3] and to ensure the head is uncovered and the baby does not have an infection or fever[3].

A variety of baby wrapping techniques appropriate to the baby's developmental age can be used based on the principles of safe wrapping. For example, a younger baby (less than 3 months) may have their arms included in the wrap to reduce the effects of the Moro or 'startle' reflex; whilst an older baby (more than 3 months) may have their lower body wrapped with their arms free, to allow the baby access to their hands and fingers which promotes self soothing behaviour, while still reducing the risk of the baby turning to the tummy position. The Moro or 'startle' reflex should have disappeared by the time the baby is 4-5 months of age.

Principles of Safe Wrapping

- Ensure that baby is positioned on the back with the feet at the bottom of the cot.
- Ensure that baby is wrapped from below the neck to avoid covering the face.
- Sleep baby with face uncovered (no doonas, pillows, cot bumpers, lambs wool or soft toys in the sleeping environment).
- Use only lightweight wraps such as cotton or muslin (bunny rugs and blankets are not safe alternatives as they may cause overheating)[10].
- The wrap should not be too tight and must allow for hip and chest wall movement[8,9].
- Make sure that baby is not over dressed under the wrap. Use only a nappy and singlet in warmer weather and add a lightweight grow suit in cooler weather.
- Provide a safe sleeping environment (safe cot, safe mattress, safe bedding).
- Babies must not be wrapped if sharing a sleep surface (including bed-sharing) with an adult. Sharing a sleep surface with a baby can be hazardous in certain circumstances. See SIDS and Kids information statement 'Sleeping with a baby' for advice about sharing a sleep surface with a baby.
- Modify the wrap to meet the baby's developmental changes, eg. arms free once 'startle' reflex begins to disappear at around 3 months; (Moro or 'startle' reflex should have disappeared by 4-5 months).
- When baby is able to roll from their back to their tummy and then onto their back again during supervised play (usually 4-6 months) the use of a wrap can be discontinued for settling and sleep. The wrap may prevent an older baby who has turned onto their tummy during sleep from returning to the back sleeping position.

Examples of techniques that can be used to wrap a baby based on their developmental age. Reduce the effects of the Moro or startle reflex for a younger baby by including arms in wrap. Help an older baby stay on their back by wrapping their lower body, but leaving their hands and arms free to self soothe. Most babies eventually resist being wrapped.

0-3 months

3-6 months

The SIDS and Kids '*Safe Wrapping: Guidelines for safe wrapping of young babies'* pamphlet shows you how to wrap your baby safely.

Benefits of wrapping

- Wrapping is a useful method to help babies settle and sleep on their back. Scientific studies have shown that wrapping can have a calming, sleep-promoting effect on young babies.
- Studies have shown that wrapping can promote more-sustained sleep and reduce the frequency of spontaneous awakenings.[1, 2] However, babies are more responsive to environmental noise when wrapped and on their back.[5]
- Some studies have shown that wrapping in infants sleeping on their back is associated with reduced Sudden Infant Death Syndrome (SIDS) risk.[3]

ALERT! Tummy sleeping increases the risk of Sudden Infant Death Syndrome (SIDS) and must be avoided. Placing a wrapped baby on their tummy to sleep is especially dangerous as it prevents them moving to a safe position.

Most babies eventually resist being wrapped. This usually happens around the age of six months. An alternative to wrapping is to use a safe infant sleeping bag.

How to safely wrap your baby

① Place baby off-centre (to left or right) with top of wrap level with shoulders.

② Fold baby's arm across chest and bring shorter side of wrap across baby's arm and tuck firmly under baby.

③ Bring larger side of wrap across and tuck under baby.

④ Bring the bottom of the wrap up on top of baby.

⑤ Fold the bottom of the wrap under baby.

⑥ Always sleep baby on their back with head and face uncovered.

For more detailed information on wrapping infants please refer to our Information Statement - 'Wrapping Infants' under Current Topics at www.sidsandkids.org

I also enjoy other tummy positions

When I am 2-3 months I can...

- stay on my tummy for 10-15 minutes
- lift my head up and look around

Key strategies

To ensure a fun and successful tummy playtime:

- Choose a comfortable time when your baby is awake e.g. after a nappy change, bath or sleep
- Try a variety of tummy positions
- Interact with your baby, e.g. talking, singing, playing with musical toys or textured toys

Back to Sleep
Tummy to Play
Sit up to watch the world

sids and kids®

Queensland Government
Queensland Health

For further information talk to your doctor or child health nurse at your local Community Health Centre; call SIDS and Kids in your state or territory on

1300 308 307

or visit the SIDS and Kids website

www.sidsandkids.org

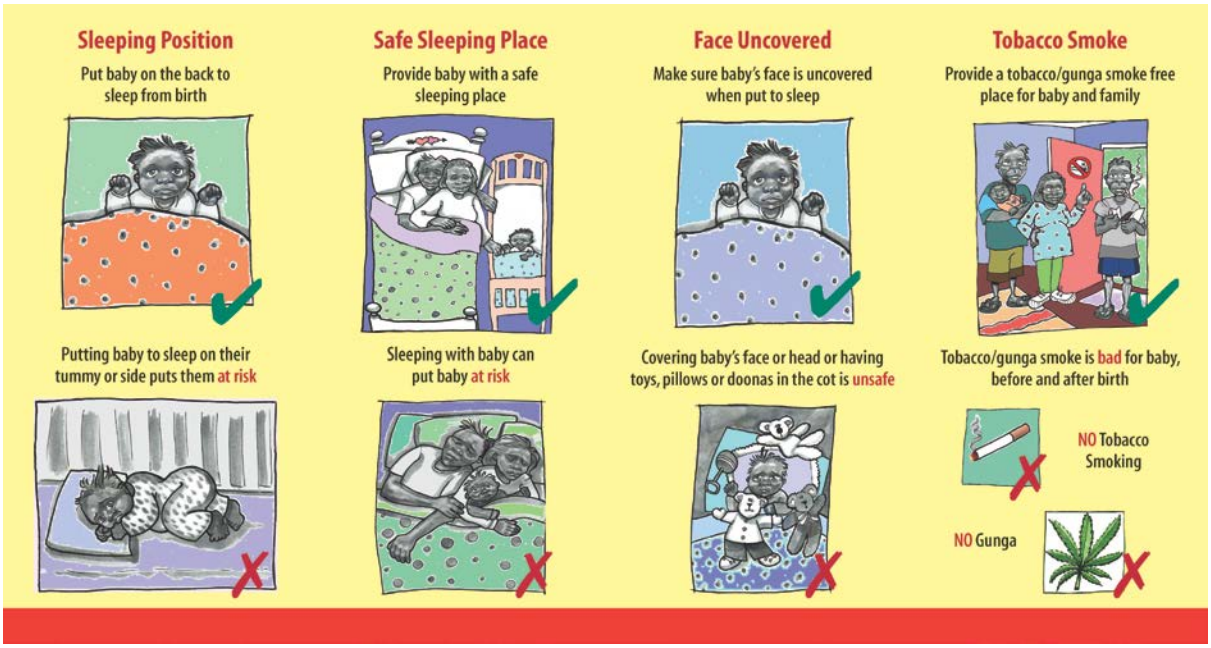
Proudly sponsored by

grobag®
www.grobag.com.au
1800 777 107

sids and kids®

Tummy time

Why tummy time is important for babies


Sleeping Position
Put baby on the back to sleep from birth
Putting baby to sleep on their tummy or side puts them at risk
Safe Sleeping Place
Provide baby with a safe sleeping place
Sleeping with baby can put baby at risk
Face Uncovered
Make sure baby's face is uncovered when put to sleep
Covering baby's face or head or having toys, pillows or doonas in the cot is unsafe
Tobacco Smoke
Provide a tobacco/gunga smoke free place for baby and family
Tobacco/gunga smoke is bad for baby, before and after birth
NO Tobacco Smoking
NO Gunga

SESSION 1

What You Need To Know About Sudden Infant Death Syndrome (SIDS)

"SIDS" is the term used to describe the sudden death of an infant younger than one year of age that remains unexplained after a complete investigation.[1] Over the past two decades, nurses, physicians, other health care providers, and caregivers have made significant progress in reducing the number of American infants who die each year of SIDS. This decrease was largely the result of the actions of health care providers and public health campaigns that have educated parents and caregivers about risk factors for SIDS.

As a result, the United States has seen a 50 percent decrease in the SIDS rate and a significant decline in the number of infants who are placed to sleep on their stomachs (prone position).

Despite this progress, SIDS remains the leading cause of death among U.S. infants between one month and one year of age.[2] Several studies show that the safe sleep message is not sufficiently reaching all segments of society.[3,4] Reducing the SIDS rate requires knowledge and action by parents, caregivers, and all health care providers.

Nurses who care for newborns and infants play a critical role in this effort. The partners in *Back to Sleep*, a national campaign that seeks to educate caregivers about SIDS risk-reduction strategies, are working with national nursing associations to spread safe sleep messages to their members.

As a nurse, you are an important role model for parents and families. By consistently placing infants to sleep on their backs and using other safe sleep practices while infants are still in the hospital, you can help to model the risk-reduction recommendations. By disseminating information, you can also help to educate families about SIDS risk factors and to reinforce ways to reduce the risk of SIDS.

SIDS Risk-Reduction Recommendations

- **Always place the baby on his or her back to sleep for naps and at night.** The back sleep position is the safest, and every sleep time counts.

- **Place the baby to sleep on a firm sleep surface, such as on a safety-approved* crib mattress, covered by a fitted sheet.** Never place the baby to sleep on pillows, quilts, sheepskins, or other soft surfaces.

- **Keep soft objects, toys, and loose bedding out of the baby's sleep area.** Don't use pillows, blankets, quilts, sheepskins, or pillow-like crib bumpers in the baby's sleep area, and keep all items away from the baby's face. If you choose to use a blanket, place the baby with his or her feet at the end of the crib. The blanket should reach no higher than the baby's chest. Tuck the ends of the blanket under the crib mattress to ensure safety.

- **Do not allow smoking around the baby.** Don't smoke before or after the birth of the baby, and don't let others smoke around the baby.

- **Keep the baby's sleep area close to but separate from where you and others sleep.** The baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you. If you bring the baby into bed with you to breastfeed, put him or her back in a separate sleep area, such as a bassinet, crib, cradle, or a bedside co-sleeper (an infant bed that attaches to an adult bed) when finished.

- **Think about using a clean, dry pacifier when placing the baby down to sleep,** but don't force the baby to take it. If breastfeeding, wait until the baby is one month of age or is used to breastfeeding before using a pacifier.

- **Do not let the baby overheat during sleep.** Dress the baby in light sleep clothing and keep the room at a temperature that is comfortable for an adult.

- **Avoid products that claim to reduce the risk of SIDS** because most have not been tested for effectiveness or safety.

- **Do not use home monitors to reduce the risk of SIDS.** If you have questions about using monitors for other conditions, talk to your health care provider.

- **Reduce the chance that flat spots will develop on the baby's head.** Provide Tummy Time when the baby is awake and someone is watching; hold the baby upright when he or she is not sleeping; change the direction that the baby lies in the crib from one week to the next; and avoid too much time in car seats, carriers, and bouncy seats.

Talk about SIDS risk to child care providers, grandparents, babysitters, and everyone who cares for the baby.

As more research is conducted on infant sleep position and SIDS, the partners in the *Back to Sleep* campaign will continue to modify their recommendations so that the most scientifically sound information is communicated to families and caregivers.

* U.S. Consumer Product Safety Commission. *Crib Safety Tips*. http://www.cpsc.gov/cpscpub/pubs/cribsafe.html

Source: Eunice Kennedy Shriver National Institute of Child Health and Human Development. (2005). *Safe Sleep for Your Baby: Reduce the Risk of Sudden Infant Death Syndrome (SIDS).* NIH Pub No. 05-7040; and Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics, 116,* 1245–1255.

SESSION 2

How To Communicate SIDS Risk-Reduction Techniques to Parents and Caregivers

Nurses are in a unique position to educate parents and caregivers about SIDS and to help them learn and follow SIDS risk-reduction measures. Because nurses counsel parents during the prenatal period, during labor and delivery, in the immediate postpartum period, and after the baby goes home, they are often among a family's most trusted advisors on how to properly care for newborns.

Nurses have the power to influence parents' behavior by modeling safe sleep practices while the infant is in the hospital, and by following up with parents and caregivers to encourage compliance after the family goes home. By demonstrating safe sleep practices themselves, nurses can help families learn how to reduce the risk of SIDS.

As described in Session 1, the SIDS rate and the prevalence of stomach sleeping have declined dramatically in the United States over the last two decades. However, 13 percent of parents and caregivers still place their babies to sleep on their stomachs,[118] despite the higher SIDS risk. Health care providers, child care providers, and others need to make a greater effort to encourage back sleeping in all communities and to eliminate the use of soft bedding, pre- and postnatal exposure to cigarette smoke, and other factors that put a baby at risk of SIDS.

Now that you know more about SIDS, its possible mechanisms, and its risk factors, consider the impact that nurses like you can have on parental behavior in reducing SIDS risk. This session explains some of the ways that you can teach parents and caregivers how to reduce a baby's risk of SIDS, and how to best communicate safe sleep messages.

In fact, babies may actually clear secretions better when placed on their backs. Figures 3 and 4 show the orientation of the trachea to the esophagus in the back sleeping (Figure 3) and stomach sleeping (Figure 4) positions. When a baby is in the back sleeping position, the trachea lies on top of the esophagus. Anything regurgitated or refluxed from the esophagus must work against gravity to be aspirated into the trachea. Conversely, when a baby is in the stomach sleeping position, anything regurgitated or refluxed will pool at the opening of the trachea, making it easier for the baby to aspirate.

ORIENTATION OF THE TRACHEA TO THE ESOPHAGUS

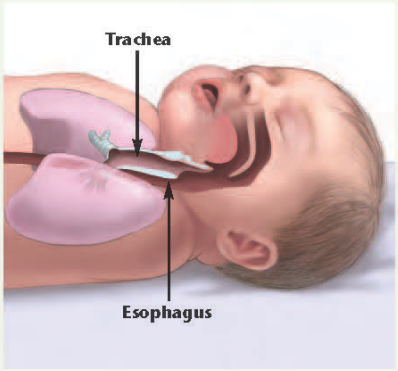


Figure 3.
Upper-Respiratory Anatomy: Baby in the Back Sleeping Position

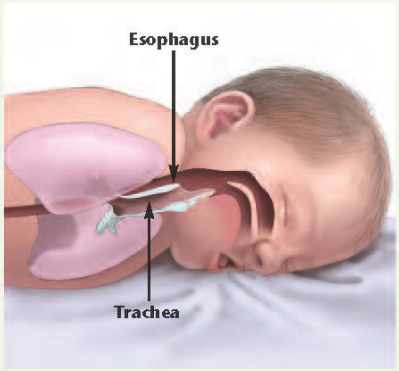


Figure 4.
Upper-Respiratory Anatomy: Baby in the Stomach Sleeping Position

Comfort of the Infant

It is true that some infants who lie on their backs do not sleep as deeply as those who lie on their stomachs. Similarly, infants who are placed on their backs may be fussy or cry. However, the absence of very deep sleep is believed to help protect infants against SIDS.[144, 145] As described in Session 1, babies who are placed on their stomachs sleep more deeply, are less reactive to noise, experience less movement, and are less able to be aroused than back sleeping infants.[146] *It is theorized that these factors may place an infant at higher risk for SIDS.* So, even though comfort is important, the infant's safety is more important; the back sleep position should be used even if the infant seems to sleep less comfortably.

Some products (e.g., wedge) claim to be designed to keep a baby in one position and to reduce the risk of SIDS. These products and others have not been tested for safety or effectiveness. These items are not recommended unless prescribed by a physician.

Flattened Skull

As you know, an infant's skull comprises free-floating bones that grow apart and together over the course of infancy to accommodate the growth and development of the brain. The appearance of persistent flat spots on an infant's head is known as *plagiocephaly.* In some cases, repeated external pressure on one area of the

Encouraging Parents To Take Action

Studies show that patients are more likely to recall and comply with instructions when a health care provider uses a positive tone, provides adequate information, and allows the patient to ask most of the questions.[154] These findings suggest that the way in which nurses deliver SIDS risk-reduction messages has a significant impact on whether parents follow the advice they receive.

You may want to seek guidance from various theories of health behavior when talking to parents about safe infant-sleeping practices. According to one well-accepted theory,* watching the positive actions of others serves as a powerful motivator and predictor of parent compliance. The heart of this theory is that people tend to imitate behavior that they have recently seen. To encourage this kind of learning through observation, you need to ensure that the following four conditions are met:[155]

1. **Attention**. Finding an optimal time for education when the parents are alert will increase attention to the message. Anything that diverts attention decreases learning. In terms of SIDS risk reduction, for example, a parent who is fatigued, distracted, or overwhelmed following childbirth is less likely to learn well. Therefore, you may want to start educating parents about SIDS before the baby is born, again when the baby comes home, and once more during the immediate postpartum period.
2. **Retention**. For SIDS risk-reduction recommendations to be retained, it is vital that you consistently model the behavior of placing infants on their backs to sleep. To retain (or remember) what is observed, imagery and language are important: People store what they have seen in the form of mental images or verbal descriptions. When stored, parents can later "bring up" the image or description so that they can reproduce it with their own behavior.
3. **Reproduction**. You need to provide opportunities for parents to practice placing their baby in the back sleep position and then provide feedback and encouragement. Parents must model the behavior that nurses have demonstrated: putting their baby to sleep on his or her back, in a crib free of loose bedding, and wearing only sleep clothing and no blanket. Role-playing with parents can also help them practice communicating to grandparents and others about why back sleeping is safest.
4. **Motivation**. Convincing parents of the benefits of the practice is critical to their motivation to implement the recommendations. To do so, nurses should:
   - Provide convincing arguments for placing infants to sleep on their backs (called past reinforcement or traditional behaviorism);
   - Demonstrate how easy it is to do (called promised reinforcement); and
   - Reinforce that parents are doing what is best for their baby and that they should continue to do so until the child's first birthday (called vicarious reinforcement).

Nurses can reinforce parents' confidence and interest in performing new skills by providing ongoing encouragement and praise.

*Social Cognitive Theory or Social Learning Theory

Continuing Education Program on SIDS Risk Reduction

Share the information below with parents and caregivers to educate them on ways to reduce the risk of SIDS.

- **Always place the baby on his or her back to sleep for naps and at night.** The back sleep position is the safest, and every sleep time counts.
- **Place the baby to sleep on a firm sleep surface, such as on a safety-approved* crib mattress, covered by a fitted sheet.** Never place the baby to sleep on pillows, quilts, sheepskins, or other soft surfaces.
- **Keep soft objects, toys, and loose bedding out of the baby's sleep area.** Don't use pillows, blankets, quilts, sheepskins, or pillow-like crib bumpers in the baby's sleep area, and keep all items away from the baby's face. If you choose to use a blanket, place the baby with his or her feet at the end of the crib. The blanket should reach no higher than the baby's chest. Tuck the ends of the blanket under the crib mattress to ensure safety.
- **Do not allow smoking around the baby.** Don't smoke before or after the birth of the baby, and don't let others smoke around the baby.
- **Keep the baby's sleep area close to but separate from where you and others sleep.** The baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you. If you bring the baby into bed with you to breastfeed, put him or her back in a separate sleep area, such as a bassinet, crib, cradle, or a bedside co-sleeper (an infant bed that attaches to an adult bed) when finished.
- **Think about using a clean, dry pacifier when placing the baby down to sleep,** but don't force the baby to take it. If breastfeeding, wait until the baby is one month of age or is used to breastfeeding before using a pacifier.
- **Do not let the baby overheat during sleep.** Dress the baby in light sleep clothing and keep the room at a temperature that is comfortable for an adult.
- **Avoid products that claim to reduce the risk of SIDS** because most have not been tested for effectiveness or safety.
- **Do not use home monitors to reduce the risk of SIDS.** If you have questions about using monitors for other conditions, talk to your health care provider.
- **Reduce the chance that flat spots will develop on the baby's head.** Provide Tummy Time when the baby is awake and someone is watching; hold the baby upright when he or she is not sleeping; change the direction that the baby lies in the crib from one week to the next; and avoid too much time in car seats, carriers, and bouncy seats.

Share these messages with parents, child care providers, grandparents, babysitters, and everyone who cares for the baby.

* U.S. Consumer Product Safety Commission. *Crib Safety Tips.* http://www.cpsc.gov/cpscpub/pubs/cribs4s.html

Sources: Eunice Kennedy Shriver National Institute of Child Health and Human Development. (2005). *Safe Sleep for Your Baby: Reduce the Risk of Sudden Infant Death Syndrome (SIDS).* NIH Pub No. 05-7040; and Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics 116,* 1245–1255.

References

AAP. (2008). The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk.

Abdulrazzaq, YM., Kendi, A.A., & Nagelkerke, N. (2008a). Child care practice in the United Arab Emirates: the ESACCIPS study. *Acta Paediatr., 97*(5), 590-595.

Abdulrazzaq, Yousef , Kendi, Asma Al, & Nagelkerke, Nicolaas. (2008b). Child care practice in the United Arab Emirates: the ESACCIPS study. *Acta Paediatrica, 97*(5), 590-595.

Abu-Baker, N. (2005). *Enviromental Tobacco smoke exposure and birth outcomes.* (PhD), University of Cncinati, 2005, 114 pages; , Ohio, Cncinati, USA.

Abu-Salah, O. (2011). Unfavourable outcomes associated with late preterm birth: observations from Jordan. *J Pak Med Assoc., 8*(8), 769-772.

Abuidhail, J., Al-Modallal, H., Yousif, R., & Almresi, N. (2013). Exclusive breast feeding (EBF) in Jordan: Prevalence, duration, practices, and barriers. *Midwifery*. doi: 10.1016/j.midw.2013.01.005

Al-ashgar, O. (Ed.). (2005). *Islamic law, in Ketab and Suna "(fate and destiny),* . Amman, Jordan: Dar Al-nafies.

Al-Maghmsi, S. (2010). http://audio.islamweb.net

Al-manasaire, M. (Ed.). (2011). *History of Jordan*. Amman, Jordan.

Alkelani , A., & Alshrifeen , N. (2011a). *Introduction of social and education research* (2 ed.). Amman, Jordan: Dar Almasira.

Alkelani , A., & Alshrifeen , N. (Eds.). (2011b). *Introduction of social and education research*. Amman, Jordan: Dar Almasira.

Alrai Newspaper. (2013). The second ISO for KAUH. Retrieved 26 Feb, 2013, from http://m.alrai.cdom/article_m/9831.html

Altal, S. (2013). A development in the services sector, Health sector. *Adustour Jordanian newspaper*. Retrieved 01 Jan, 2013, from www.addustour.com

Altal, Y., & Bataineh, H. (2006). Low birth weight: risk factors in Irbid, Jordan. . *RMJ, 31*(2), 61-63.

American Academy of Pediatrics. (2000). Task force on infant sleep position and sudden infant death syndrome. Changing concepts of sudden infant death syndrome: implications for infant sleeping environment and sleep position. *Pediatrics, 105*(3), 650- 656.

American Academy of Pediatrics. (2005). Task force on sudden infant death syndrome. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. . *Pediatrics, 116*(5), 1245-1255.

American Academy of Pediatrics. (2011a). SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics, 128*(5), 1030 -1039.

American Academy of Pediatrics. (2011b). SIDS and other sleep related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics, 128*(5), e1341 -e1367.

American Academy of Pediatrics. (2013). A child care provider's guide to safe sleep. Retrieved 04 Feb, 2014, from http://www.healthychildren.org/English/family-life/work-play/pages/A-Child-Care-Provider%27s-Guide-to-Safe-Sleep.aspx

American SIDS Institute. (2009). Reducing the risk of SIDS. Retrieved 10 Oct, 2012, from http://www.sids.org/nprevent.htm

American SIDS Institute. (2011). Reducing the risk of SIDS. Retrieved 22 Jan, 2012, from http://www.sids.org/nprevent.htm

Anderson, M., Johnson, D., & Batal, H. (2005). Sudden infant death syndrome and prenatal maternal smoking: rising attributed risk in the back to sleep era. *BMC Medicine, 3*(4), 1-7.

APA. (2011a). SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *American Academy of Pediatrics, 128*(5), 1341-1329.

APA. (2011b). SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment. *Pediatrics, 128*(5), 1340-1368.

Aris, C., Cote-Arsenault, D., & Stevens, T. (2013). Impact of nurse education on safe sleep in the NICU. Retrieved 02 May, 2013, from http://sidscenter.org/trainingtoolkit.html

Aris, C., Stevens, T., Lemura, C., Lipke, B., McMullen, S., Cote-Arsenault, D., & Consenstein, L. (2006). NICU nurses' knowledge and discharge teaching related to infant sleep position and risk of SIDS. *Adv Neonatal Care, 6*(5), 281-294.

Ateah, C., & Hamelin, K. (2008). Maternal bedsharing practices, experiences, and awareness of risks. *JOGNN, 37*(3), 274-281.

Athanasakis, E., Karavasiliadou, S., & Styliadis, I. (2011). The factors contributing to the risk of sudden infant death syndrome. *Hippokratia, 15*(2), 127–131.

Awqati, NA., Ali, MM., Al-Ward, NJ., Majeed, FA., Salman, K., Al-Alak, M., & Al-Gasseer, N. (2009). Causes and differentials of childhood mortality in Iraq. *BMC Pediatr, 9*(40), 9-40.

Azab, M. , Khabour, OF., Alzoubi , KH., Anabtawi , MM., Quttina , M., Khader , Y., & Eissenberg, T. (2013). Exposure of pregnant women to waterpipe and cigarette smoke. *Nicotine Tob Res, 15*(1), 231-237.

Bada, H., Das, A., Bauer, C., Shankaran, B., Lester, B., Gard, C., . . . Higgins, R. (2005). Low birth weight and preterm births: etiologic fraction attributable to prenatal drug exposure. *J Perinatol., 25*(10), 631–637

Barrett, AM. (1954). *Recent advances in paediatrics.* London: Churchill Press.

Bataineh, H., Shawagfeh, H., & Twalbeh, A. (2008). The Infant Mortality Rate in Irbid, Jordan. *Middle East J, 1*(2), 9-10.

Bataineh, Hussein, Hussein Shawagfeh, & Twalbeh, Alla. (2008). The Infant Mortality Rate in Irbid, Jordan. *MIDDLE EAST JOURNAL OF INTERNAL MEDICINE 1*(2), 9-10.

Bazeley, P. (Ed.). (2007). *Qualitative data analysis with NVivo*. London: Sage.

Beckwith, JB. . (2003). Defining the sudden infant death syndrome. *Arch Pediatr Adolesc Med, 157*(3), 286–290.

Behm, I., Kabir, Z., Connolly, GN., & Alpert, HR. (2012). Increasing prevalence of smoke-free homes and decreasing rates of sudden infant death syndrome in the United States: an ecological association study. *Tob Control, 21*(1), 6-11.

Bernabé, J., Soriano, T., Albaladejo, R., Juarranz, M., Calle, M., Martínez, D., & Domínguez-Rojas, V. (2004). Risk factors for low birth weight: a review. *Eur J Obstet Gynecol Reprod Biol. , 116*(1), 3-15.

Blair, P., Mitchell, A. , Heckstall-Smith, E., & Fleming, J. (2008). Head covering – a major modifiable risk factor for sudden infant death syndrome: a systematic review. *Arch Dis Child. , 93*(9), 778-7837.

Blair, PS., Platt, MW., Smith, IJ., & Fleming, PJ. . (2006). Sudden infant death syndrome and the time of death: factors associated with night-time and day-time deaths. *JournalInt J Epidemiol, 35*(6), 1563-1569.

Boog, B. (2003). The emancipatory character of action research: its history and the present state of the art. *J Community Appl Soc Psychol, 13*, 426-438.
Bornstein, R. (2013). *The sage encyclopedia of social science research methods: face validity* (pp. 368-369). Retrieved from http://srmo.sagepub.com/view/the-sage-encyclopedia-of-social-science-research-methods/n323.xml
doi:http://dx.doi.org/10.4135/9781412950589.n323
Bredemeyer, SL. (2004). Implementation of the SIDS guidelines in midwifery practice. *Aust J Midwifery, 17*(4), 17-21.
Bresciani, M., Zelna, C., & Anderson, J. (2004). Assessing student learning and development: Interviews and focus groups http://www.hettler.com/direct/assess/interviews%20and%20focus%20groups.htm
Brown, J. (2013). Australian teacher's refugee wake-up call. *Eureka Street, 23*(6), 29-30. http://search.informit.com.au.ezproxy.ecu.edu.au/documentSummary;dn=295484214227411;res=IELLCC
Bruce, N., Perez-Padilla, R., & Albalak, R. (2000). Indoor air pollution in developing countries: a major environmental and public health challenge. *Bull World Health Organ, 78*(9), 1078-1092.
Bullock , L., Mickey, K., Green, J., & Heine, A. (2004). Are nurses acting as role models for the prevention of SIDS. *MCN Am J Matern Child Nurs, 29*(3), 172-177.
Burd, L., Peterson, M., Face, G. , Face, F. , Shervold, D., & Klug, M. (2007). Efficacy of a SIDS risk factor education methodology at a Native American and Caucasian Site. *Matern Child Health J, 11*(4), 365–371.
Burns , N., & Grove , S. (2007). *Understanding nursing research* (Vol. 4th ed). New Delhi: Elsevier.
Burns, N., & Grove, S. (Eds.). (2005). *The practice of nursing research: conduct, critique, and utilization* (5th ed.): Elsevier Inc.
Byard, W. (2001). Inaccurate classification of infant deaths in Australia: a persistent and pervasive problem. *Med J Aust, 175*(1), 5-7.
Carmona, RV. (2006). Remarks at press conference to launch health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General. *The Health Effects of Secondhand Smoke.* Retrieved 21 December 2012, from http://www.surgeongeneral.gov/news/speeches/06272006a.html
Carpenter, R., McGarvey, C., Mitchell, EA., Tappin, DM., Vennemann, MM., Smuk, M., & Carpenter, JR. (2013). Bed sharing when parents do not smoke: is there a risk of SIDS? an individual level analysis of five major case-control studies. *BMJ, 28*(5), 1-11.
Carroll-Pankhurst, C., & Mortimer, EA. (2001). Sudden infant death syndrome, bedsharing, parental weight, and age at death. *Pediatrics, 107*(3), 530–536.
CDC. (2008). Preventing smoking and exposure to secondhand smoke before, during, and after pregnancy. Retrieved 8 March, 2010, from http://www.cdc.gov/chronicdisease/resources/publications/fact_sheets/smoking.htm
CDC. (2010, 12 May 2012). SIDS rate and back sleeping (1988 – 2006),. Retrieved 02 Feb, 2014, from http://www.nichd.nih.gov/SIDS/upload/SIDS_rate_back_sleep_2006.pdf
CDC. (2014). Sudden Infant Death Syndrome (SIDS) and Sudden Unexpected Infant Death (SUID): Home. Retrieved 18 Augest 2013, from Department of Health and Human Services,Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA http://www.cdc.gov/sids/
Chung-Park, MS. (2012). Knowledge, opinions, and practices of infant sleep position among parents. *Mil Med, 177*(2), 235-239.

Cohen, J. (Ed.). (1988). *Statistical power analysis for the behavioral sciences*. New York, USA: Routledge, L. Erlbaum Associates.
Colson, E. R., & Cohen J. S., (2002). "Changing nursery practice gets innercity infants in the supine position to sleep." Arch Dis Child **156**(1): 717–720.
Connor, N., Tanabe, K., Siadaty, M., & Hauck, F. . (2009). Pacifiers and breastfeeding: a systematic review *Arch Pediatr Adolesc Med., 163*(4), 378-382
Cooke, R.T., & Welch, R.D. (1964). A study in cot death. *Br Med J, 5424* (Dec 19), 1549 - 1554.
Creswell, J., & Plano Clark, V. (Eds.). (2007). *Designing and conducting mixed method research*. London: Sage Publications.
Darrah, J., & Bartlett, DJ. (2013). Infant rolling abilities--the same or different 20 years after the back to sleep campaign? *Early Hum Dev., 89*(5), 311-314.
DOS. (2011). The demographic profile of Jordan *Estimated Population by Governorate*. Amman, Jordan: DOS.
DOS. (2012). Jordan statistics report. Retrieved 25 June 2012, from http://www.dos.gov.jo/dos_home_a/main/index.htm
DOS. (2013). *The demographic profile of Jordan*. Amman, Jordan: Retrieved from http://www.escwa.un.org/popin/members/Jordan.pdf.
Efe, E., Sarvan, S., & Kukulu, K. (2007). Sleep practices and environment and the risk of sudden infant death syndrome in Turkey. *Journal for Specialists in Pediatric Nursing: JSPN, 12*(4), 253-263.
Eisenstein, E.M., Ben-Yehuda, Y., Shemesh, N., & Kharasch, S. (2012). Investigation of unexplained infant deaths in Israel: time for a different approach. *Isr Med Assoc J., 14*(11), 695-699.
Emmelin, A., & Wall, S. (2007). Indoor air pollution: a poverty-related cause of mortality among the children of the world. *Chest., 132*(5), 1615-1623.
Etzel, RA. (2007). Indoor and outdoor air pollution: tobacco smoke, moulds and diseases in infants and children. *Int J Hyg Environ Health, 210*(5), 611-616.
Fals-Borda, O. (Ed.). (2001). *Participatory (action) research in social theory: Origins and challenges. In P. Reason & H. Bradbury (Eds.), Handbook of action research: Participative inquiry and practice (pp.27-37)*. London: Sage Publications.
Ferng, SF., & Lee, LW. (2002). Indoor air quality assessment of daycare facilities with carbon dioxide, temperature, and humidity as indicators. *J Environ Health., 65*(4), 14-18.
FIMR. (2005). *SIDS, home air pollution, alternative heating methods,and infant safe sleep. a resource guide for service providers*. USA: Community Health Bureau, Fetal Infant Mortality Program Retrieved from http://media.wix.com/ugd/c85e1c_b48231f851a0b030826e27da91461b04.pdf.
Franco, P., Scaillet, S., Wermenbol, V., Valente, F., Groswasser, J., & Kahn, A. (2000). The influence of a pacifier on infants' arousals from sleep. *J Pediatr, 136*(6), 775–779.
Gaffney, KF. (2001). Infant exposure to environmental tobacco smoke. *J Nurs Scholarsh, 33*(4), 343-347.
Gandevia, B. . (1978). *Tears often shed - child health and welfare in Australia from 1788*. Sydney: Charter Books.
Gelfer, P., Cameron, R., Masters, K. , & Kennedy, KA. (2013). Integrating "Back to Sleep" recommendations into neonatal ICU practice. *Pediatrics, 131*(4), e1264-1270.
Glinianaia, Svetlana, Rankin, Judith, Bell, Ruth, Pless-Mulloli, Tanja, & Howel, Denise. (2004). Does particulate air pollution contribute to infant death? a systematic review. *Environ Health Perspect, 112*(14), 1365–1370.

Gouna, G1. , Rakza, T. , Kuissi, E. , Pennaforte, T. , Mur, S. , & Storme, L. (2013). Positioning effects on lung function and breathing pattern in premature newborns. *J Pediatr., 162*(6), 1133-1137.

Grazel, R., Phalen, AG., & Polomano, RC. (2010a). Implementation of the American Academy of Pediatrics recommendations to reduce sudden infant death syndrome risk in neonatal intensive care units: An evaluation of nursing knowledge and practice. *Adv Neonatal Care, 10*(6), 332-342.

Grazel, R., Phalen, AG., & Polomano, RC. (2010b). Implementation of the American Academy of Pediatrics recommendations to reduce sudden infant death syndrome risk in neonatal intensive care units: an evaluation of nursing knowledge and practice. *Adv Neonatal Care, 10*(6), 332-342.

Guntheroth, WG., & Spiers, PS. (1992). Sleeping prone and the risk of sudden infant death syndrome. *JAMA, 6;267*(17), 2359-2362.

Haddad, L., Al-Zyoud, S., Abu-Baker, N., Gharaibeh, H., El-Shahawy, O., & Alramadhani, R. (2011). Secondhand smoking in Jordan: clearing the air for one of the highest tobacco prevalence countries in the Middle East. *Tob Use Insights, 4*, 1-7. doi: 10.4137/TUI.S6802

Halcomb, E.J., Gholizadeh, L., DiGiacomo, M., Phillips, J., & Davidson, P. . (2007). Literature review: considerations in undertaking focus group research with culturally and linguistically diverse groups. *J Clin Nurs, 16*(6), 1000 -1011.

Harris, ML., Massaquoi, D., Soyemi, K., Brend, SM., Klein, D., Pentella, M., . . . Pleva, A. (2012). Recent Iowa trends in sudden unexpected infant deaths: the importance of public health collaboration with medical examiners' offices. *Am J Forensic Med Pathol., 33*(2), 113-118.

Hauck, F., & Tanabe, K. (2008a). International Trends in Sudden Infant Death Syndrome and Other Sudden Unexpected Deaths in Infancy: Need for Better Diagnostic Standardization. Retrieved 21 April 2014, from http://ispid.webseiten.cc/fileadmin/user_upload/textfiles/articles/CPR17_Hauck_SIDS_Trends.pdf

Hauck, F., & Tanabe, K. (2008b). International Trends in Sudden Infant Death Syndrome: Stabilization of Rates Requires Further Action. *Pediatrics, 122*(660), 660-666.

Hauck, Fern, Omojokun, Olanrewaju, & Siadaty, Mir. (2005a). Do pacifiers reduce the risk of sudden infant death syndrome? a meta-analysis. 2004-2631. http://pediatrics.aappublications.org/content/116/5/e716.full.html doi:10.1542/peds.2004-2631

Hauck, FR, ., Moore, CM., Herman, SM., Donovan, M., Kalelkar, M., & Christoffel, KK. (2002). The contribution of prone sleeping position to the racial disparity in sudden infant death syndrome. *Pediatrics, 110*(4), 772–780.

Hauck, FR., Omojokun, OO., & Siadaty, MS. (2005b). Do pacifiers reduce the risk of sudden infant death syndrome? a meta-analysis. *Pediatrics, 116*(5), e716-723.

Hawamdeh, A., Kasasbeh, F. A., & Ahmad, M. A. (2003). Effects of passive smoking on children's health: a review. *Eastern Mediterranean Health Journal, 9*(3), 441-447.

Healthy Canadians. (2009). Sudden infant death syndrome. Retrieved 25 Sep, 2011, from http://www.hc-sc.gc.ca/ahc-asc/minist/messages/_2009/2009_10_02a-eng.php

Heinig, J. , & Banuelos, J. (2006). American Academy of Pediatrics task force on sudden infant death syndrome (SIDS) statement on SIDS reduction: friend or foe of breastfeeding? *J Hum Lact, 22*(1), 7-10.

Henriksen, T (1999). Foetal nutrition, foetal growth restriction and health later in life. *Acta Paediatr Suppl, 88*(429), 4-8.

Hesselink, AE., Van Poppel, MN., Van Eijsden, M., Twisk, JW., & Van der Wal, MF. (2012). The effectiveness of a perinatal education programme on smoking, infant care, and psychosocial health for ethnic Turkish women. *Midwifery, 28*(3), 306-313.

Horne, RS., Sly, DJ., Cranage, SM., Chau, B., & Adamson, TM. (2000). Effects of prematurity on arousal from sleep in the newborn infant. *Pediatr Res., 47(4 Pt 1):468-74.*

Horsley, Tanya, Clifford, Tammy, Barrowman, Nicholas, Bennett, Susan, Yazdi, Fatemeh, Sampson, Margaret, . . . Côté, Aurore. (2007). Benefits and harms associated with the practice of bed sharing. *Arch Pediatr Adolesc Med, 161*(3), 237-245. doi: 10.1001/archpedi.161.3.237

Inbar, Ziona, Meibar, Ron, Shehada, Safa, Irena, Volovik, Rubin, Lisa, & Rishpon, Shmuel. (2005). "Back to sleep": parents compliance with the recommendation on the most appropriate sleeping position of infants, Haifa District, Israel, 2001. *Preventive Medicine, 40*(6), 765-768.

Index mundi. (2013). Jordan economy profile 2013. *CIA, the World Factbook, Countries, Jordan.* Retrieved 11 August 2013, from http://www.indexmundi.com/jordan/economy_profile.html

Islam today. (2013). The story of the descent of the Qur'an. Retrieved 13 August 2013, from Islam today, Reyad, Saudi Arabia www.islamtoday.net

Jamison, L., & Williams, L. (2003). Focus group methodology: explanatory notes for the novice nurse researcher. *Contemp Nurse, 14*(3), 271–280.

Jordan Medical Directory Website. (2012). Hospitals, public hospitals. *King Abdullah University Hospital (KAUH).* Retrieved 10 Oct, 2013, from http://jormedic.com/index.php/

Josif, Cath, Barclay, Lesley, Bar-Zeev, Sarah, Kildea, Sue, & Brittin, Maureen. (2012). How participatory action research supported improvements to the postnatal discharge summary system used for remote dwelling Aboriginal mothers and infants in the Top End of Australia. *Action Research, 10,* 387-405.

JUST Website. (2011). Retrieved 02 Oct, 2013, from http://www.just.edu.jo/aboutjust/

Kadam, Prashant, & Bhalerao, Supriya. (2010). Sample size calculation. *Int J Ayurveda Res., 1*(1), 55-57.

Kanetake, J., Aoki, Y., & Funayama, M. . (2003). Evaluation of rebreathing potential on bedding for infant use. *Pediatr Int., 45*(3), 284–289.

KAUH Website. (2011). Intruduction about the hospital. Retrieved 12 May, 2013, from www.kauh.jo/arabic/

Kemp, JS., Livne, M., White, DK., & Arfken, CL. . (1998). Softness and potential to cause rebreathing: differences in bedding used by infants at high and low risk for sudden infant death syndrome. *J Pediatr., 132*(2), 234–239.

Kemp, JS., & Thach, BT. (1995). Quantifying the potential of infant bedding to limit CO2 dispersal and factors affecting rebreathing in bedding. *J Appl Physiol., 78*(2), 740–745.

Khader, YS. , Al-Akour, N. , Alzubi, IM. , & Lataifeh, I. (2011). The association between second hand smoke and low birth weight and preterm delivery. *Matern Child Health J., 15*(4), 453-459.

Khalaf, I., Abu-Moghli, F., Callister, L., Mahadeen, AI., Kaawa, K., & Zomot, A. (2009). Jordanian health care providers' perceptions of post-partum health care. *Int Nurs Rev., 56*(4), 442-449.

Khalaf, IA., Abu-Moghli, F., Callister, LC., & Rasheed, R. (2008). Jordanian women's experiences with the use of traditional family planning. *Health Care Women Int, 29*(5), 527-538.

Khoury , SA, & Mas'ad , DF. (2002). Causes of infant mortality in Jordan. *Saudi Med J., 23*(4), 432-435.
Khresheh, Reham. (2007). Practice—research engagement (PRE)-Jordanian experience in three Ministry of Health hospitals. *Action Research, 5*(2), 123-138.
Kraus, JF, Greenland, S, & Bulterys, M. (1989). Risk factors for sudden infant death syndrome in the US collaborative perinatal project. *Int J Epidemiol, 18*(1), 113–120.
Krefting, Laura. (1991). Rigor in qualitative research: the assessment of trustworthiness. *Am J Occup Ther, 45*(3), 214-222.
L'hoir, MP., Engelberts, AC., Van-Well, GT., Mcclelland, S. , Westers, P., Dandachli, T., . . . Huber, J. (1998). Risk and preventive factors for cot death in the Netherlands, a low-incidence country. *Eur. J. Pediatr, 157*(8), 681–688.
Laughlin, J. , Luerssen, TG. , & Dias, MS. . (2011). Prevention and management of positional skull deformities in infants. *Pediatrics, 128*(6), 1236-1241.
Leach, CE., Blair, PS., Fleming, PJ., Smith, IJ., Platt, MW., Berry, PJ., & Golding, J. (1999a). Epidemiology of SIDS and explained sudden infant deaths. CESDI SUDI Research Group. *Pediatrics, 104*(4), e43.
Leach, Charlotte, Blair, Peter, Fleming, Peter, Smith, Iain, Platt, Martin Ward, Berry, Peter, & Golding, Jean. (1999b). Epidemiology of SIDS and Explained Sudden Infant Deaths. *Pediatrics, 104*(4), 143–147.
Lerner, Helen, McClain, Mary, & Vance, John C. (2002). SIDS education in nursing and medical schools in the United States. *J Nurs Educ, 41*(8), 353-356.
Lindlof, T. R. , & Taylor, B. C. . (2002). *Qualitative communication research methods* (2nd ed.). CA: Sage: Thousand Oaks.
Loizou, Eleni. (2013). Empowering parents through an action research parenting program. *Action Research, 11*(1), 73-91.
Mahler, J. (2004). History of sudden infant death syndrome. Retrieved 15 June, 2011, from http://www.pregnancy-place.com/The_History_of_Sudden_Infant_Death_Syndrome_SIDS_A_Few_Suggestions.html
McMullen , S., Lipke , B., & LeMura , C. (2009). Sudden infant death syndrome prevention: a model program for NICUs. *J Obstet Gynecol Neonatal Nurs, 28*(1), 7-12.
McMullen, Sherri L., Lipke, Bethann, & LeMura, Catherine. (2009). Sudden infant death syndrome prevention: a model program for NICUs. *Neonatal Network - Journal of Neonatal Nursing, 28*(1), 7-12.
Metz, M. (1989). Jordan: a country study. Washington. Retrieved 10 Augest 2013, from http://countrystudies.us/jordan/
Meyer, J. (2000). Qualitative research in health care: using qualitative methods in health related action research. *BMJ, 320*, 178-181.
Meyer, LE. , & Erler, T. (2011). Swaddling: a traditional care method rediscovered. *World J Pediatr., 7*(2), 155-160.
Ministry of Health-Jordan. (2013). Retrieved 16 Oct 2013, from http://www.moh.gov.jo/AR/StudiesandResearches/Pages/Studies.aspx
Mitchell, EA. , Blair, PS. , & L'Hoir, MP. (2006). Should pacifiers be recommended to prevent sudden infant death syndrome? *Pediatrics, 117*(5), 1755-1758.
Mitchell, EA., & Blair, PS. (2012). SIDS prevention: 3000 lives saved but we can do better. *N Z Med J., 125*(1359), 50-57.
Moon, L. (2012). Sudden infant death syndrome: an update. *Pediatr Rev., 33*(7), 314-320.
Moon, R. (Producer). (2010, 20 January 2014). National sudden and unexpected infant/ child death and pregnancy loss, Resource Center. *Hot Topics in Infant Safe Sleep: An Interactive Workshop with Rachel Moon, M.D. ASIP-Pregnancy Loss and Infant*

Death Alliance 2010. Retrieved from http://www.sidscenter.org/podcasts/ASIP_2010_Safe_Sleep.html

Moon , R., Horne , R., & Hauck , F. (2007). Sudden infant death syndrome. *The Lancet, 370*(9598), 1578 - 1587.

Moon, Rachel, Calabrese, Trisha, & Aird, Laura. (2008). Reducing the risk of sudden infant death syndrome in child care and changing provider practices: lessons learned from a demonstration project. *Pediatrics 2008;122;788, 122*(4), 788–798.

Moon, Rachel., Horne, R., & Hauck, F. (2007). Sudden infant death syndrome. *The Lancet, 370*(9598), 1578 - 1587.

Moon, RY. , Oden, RP., & Grady, KC. (2004). Back to Sleep: an educational intervention with women, infants, and children program clients. *Pediatrics, 113*(3), 542-547.

Moon, RY., & Fu, L. (2012). Sudden infant death syndrome: an update. *Pediatr Rev., 33*(7), 314-320.

Moon, RY., & Oden, RP. . (2003). Back to sleep: can we influence child care providers? . *Pediatrics, 112*(4), 878–882.

Moon, RY., & Omron, R. (2002). Determinants of infant sleep position in an urban population. *Clin Pediatr (Phila). 41*(8), 569-573.

Morrison, J., Botting, K., Seng-Soo, P., McGillick, E., Hiscock, J., Zhang, S., . . . Orgeig, S. (2012). Antenatal steroids and the IUGR fetus: are exposure and physiological effects on the lung and cardiovascular system the same as in normally grown fetuses? *J Pregnancy, Published online 22 November 2012*(ID: 839656), 1-15. doi: 10.1155/2012/839656

Munsters, JM., Wierenga, H., Boere-Boonekamp, MM., Semmekrot, BA., & Engelberts, AC. (2013). Additional recommendations for safe sleep to prevent SIDS. *Ned Tijdschr Geneeskd, 157*(8), A5568.

Nabukera, SK., Wingate, MS., Kirby, RS. , Owen, J., Swaminathan, S., Alexander, GR., & Salihu, HM. (2008). Interpregnancy interval and subsequent perinatal outcomes among women delaying initiation of childbearing. *J Obstet Gynaecol Res., 34*(6), 941-947.

Najdawi, F., & Faouri, M. . (1999). Maternal smoking and breastfeeding. *East Mediterr Health J, 5*(3), 450–456.

New Zealand Ministry of Health. (2008). Preventing sudden unexpected death in infancy. *Information for health practitioner.* Retrieved 02 September 2011, from http://www.moh.govt.nz/moh.nsf/0/5118C5C5561CEC79CC2573A6000B3BBE

New Zealand Ministry of Health. (2011). Cot death statistics. Retrieved Sep 24, 2011, from http://www.preventsids.org/2008/02/new-zealand-cot-death-sids-research.html

NICHD. (2006). NICHD alerts parents to winter sids risk and updated aap recommendations *January 18*. http://www.nih.gov/news/pr/jan2006/nichd-18.htm

NICHD. (2010). Back to Sleep public education campaign. Retrieved 26 April, 2011, from http://www.nichd.nih.gov/sids/

NICHD. (2013a). Continuing education program on SIDS risk reduction (pp. 1-38). Rockville, US: NICHD.

NICHD. (2013b). Healthy native babies project: Honoring the past, learning for the future facilitator's guide for 2-hour training. Retrieved 02 Feb, 2014, from https://www.nichd.nih.gov/publications/pubs/Documents/HNB_2Hour_Facilitators_Guide_2013.pdf

Nofal, HK., Abdulmohsen, MF., & Khamis, AH. (2011a). Incidence and causes of sudden death in a university hospital in eastern Saudi Arabia. *East Mediterr Health J., 17*(9), 665-670.

Nofal, HK., Abdulmohsen, MF., & Khamis, AH. (2011b). Incidence and causes of sudden death in a university hospital in eastern Saudi Arabia. *East Mediterr Health J, 17*(9), 665-670.
Oatey, A. (1999). The strengths and limitations of interviews as a research technique for studying tlevision viewers. Retrieved 02 Oct, 2011, from http://www.aber.ac.uk/media/Students/aeo9702.html
Okour, A., Alkhateeb, M., & Amarin, Z. (2012). Awareness of danger signs and symptoms of pregnancy complication among women in Jordan. *Int J Gynaecol Obstet, 118*(1), 11-14.
Oyen, N. , Markestad, T., Skaerven, R. , Irgens, LM. , Helweg-Larsen, K. , Alm, B. , . . . Wennergren, G. (1997). Combined effects of sleeping position and prenatal risk factors in sudden infant death syndrome: The Nordic Epidemiological SIDS Study. *Pediatrics, 100*(4), 613-621.
Pallant, J. (Ed.). (2010). *SPSS survival manual: a step by step guide to data analysis using SPSS* (4th ed.). Australia: Allen & Unwin Book Publishers, Australia.
Parish, WE., Barrett, AM., Coombs, RR., Gunther, M., & Camps, FE. . (1960). Hypersensitivity to milk and sudden death in infancy. *Lancet, 2*(7106), 1106–1110.
Patel, AL., Harris, K., & Thach, BT. (2001). Inspired CO2 and O2 in sleeping infants rebreathing from bedding: relevance for sudden infant death syndrome. *J Appl Physiol., 91*(6), 2537–2545.
Pelayo, R. , Owens, J., Mindell, J., & Sheldon, S. . (2006). Bed sharing with unimpaired parents is not an important risk for sudden infant death syndrome: To the editor. *Pediatrics, 117*, 993-994.
Polit, D., & Beck, C. (Eds.). (2007). *Nursing research: generating and assessing evidence for nursing practice*.
Pope, C., & Mays, N. (2007). *Qualitative research in health care* Vol. 26 Nov 2007. Third (Ed.) *Action Research*
Priest, N., Roseby, R., Waters, E., Polnay, A., Campbell, R., Spencer, N., . . . Ferguson-Thorne, G. (2008). Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke (Review). *The Cochrane Library*(4).
Prochaska, JO. , & Velicer, WF. (1997). The transtheoretical model of health behavior change. *Am J Health Promot, 12*(1), 38-48.
Quinn, J. (2002). Baby's bedding: is it creating toxic nerve gases? (61). http://www.midwiferytoday.com/articles/bedding.asp
Quixley, Z. (2010). Participatory action research: an outline of the concept. Retrieved 10 Oct, 2013, from http://www.suziqconsulting.com.au/free_articles_files/CD%20-%20PAR%20Detailed%20Overview%20-%202010.pdf
Reed, J. . (2005). Using action research in nursing practice with older people: democratizing knowledge. *J Clin Nurs, 14*(5), 594-600.
Safyani, A. (2013). *Manifestations of child-rearing care in the Quran*. Saudi Arabia.
Schuele, C.M., & Justice, L.M. (2006). The importance of effect sizes in the interpretation of research: primer on research. *The ASHA Leader*. Retrieved 01 Jan, 2014, from http://www.asha.org/Publications/leader/2006/060815/f060815d/
Shaban, I., Barclay, L., Lock, L., & Homer, C. (2012). Barriers to developing midwifery as a primary health-care strategy: a Jordanian study. *Midwifery, 28*(1), 106-111.
Shah, T., Sullivan, K., & Carter, J. (2006). Sudden infant death syndrome and reported maternal smoking during pregnancy. *Am J Public Health, 96*(10), 1757-1759. doi: http://www.ajph.org
Shaikh, U., & Ahmed, O. (2006). Islam and infant feeding. *Breastfeed Med, 1*(3), 164-168.

Shankaran, S., Lester, B., Das, A., Bauer, C., Bada, H., Lagasse, L., & Higgins, R. . (2007). Impact of maternal substance use during pregnancy on childhood outcome. *Semin Fetal Neonatal Med, 12*(2), 143-150.
Sharp, JM. (2013, 1 April). Jordan: background and U.S. relations. Retrieved 3 October 2013, from http://www.fas.org/sgp/crs/mideast/RL33546.pdf
Shenton, A. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22*, 63–75.
Sheppard, J. (2011). Prevention of SIDS - consider toxicity of crib mattresses. Retrieved 26 Sep, 2013, from http://EzineArticles.com/6345820
SIDS and Kids. (2011). Mission Statement. Retrieved 29 April 2011, from http://www.sidsandkids.org/offices/western-australia/
SIDS and Kids. (2013a). Research. Retrieved 4 June 2013, from http://www.sidsandkids.org/research/
SIDS and Kids. (2013b). Safe sleep recommondations. Retrieved February 20, 2013, from http://www.sidsandkids.org/offices/western-australia/
Silverman, D. (2005). *Doing qualitative research: a practical handbook.*
Simpson, T., & Chow, S. (2008). Action research: a guide to research tools. *Recreation Tourism Research Institute.* Retrieved 10 Oct, 2013, from http://web.viu.ca/rtri/Action%20Research.pdf
Sleuwen, B., Engelberts, A., Boere-Boonekamp, M., Kuis, W., Schulpen, T., & Hoir, M. (2007). Swaddling: a systematic review. *Pediatrics, 120*(4), e1097-e1106. doi: 10.1542/peds.2006-2083
Speltz, M., Collett, B., & Stott-Miller, M. (2010). Caseccontrol study of neurodevelopment in peformational plagiocephaly. *Pediatrics, 125*(3), e537-e542.
Spencer, N., & Logan, S. (2004). Sudden unexpected death in infancy and socioeconomic status: a systematic review. *J Epidemiol Community Health, 58*, 366–373. doi: 10.1136/jech.2003.011551
Spiers, PS, & Wang, L (1976). Short pregnancy interval, low birthweight, and the sudden infant death syndrome. *Am. J. Epidemiol, 104*(1), 15–21.
Sprott, J. (2004). Cot death cause and prevention experiences in New Zealand 1995–2004. *Journal of Nutritional & Environmental Medicine, 14*(3), 221-232
Switzerland., G. (1999). Tobacco Free Initiative: International Consultation on Environmental Tobacco Smoke (ETS) and Child Health. Consultation Report. In W. H. Organization, D. o. N. Diseases, T. F. Initiative & http://www.who.int/toh (Eds.).
The Jordanian Education System. (2011). Jordan universities. Retrieved 10 Sep, 2013, from www.jordaneducationsystem.com
The Office of Human Research Protection. (2012). Chapter 3, section - A, risk/benefit analysis *Insitiutional Reveiw Board Guildebook* (pp. 1-10). US.
Tong, S., & Colditz, P. (2004). Air pollution and sudden infant death syndrome: a literature review. *Paediatr Perinat Epidemiol, 18*(5), 327-335.
Trachtenberg, F., Haas, E., Kinney, H., Stanley, C., & Krous, H. (2012a). Risk factor changes for sudden infant death syndrome after initiation of Back-to-Sleep campaign. *Pediatrics, 129*(4), 630–638.
Trachtenberg, FL. , Haas, EA. , Kinney, HC. , Stanley, C. , & Krous, HF. (2012b). Risk factor changes for sudden infant death syndrome after initiation of Back-to-Sleep campaign. *Pediatrics., 129*(4), 630-638.
Trollvik, A., Eriksson, B., Ringsberg, K., & Hummelvoll, J. . (2013). Children's participation and experiential reflections using co-operative inquiry for developing a learning programme for children with asthma *Action Research, 11*, 31-51.

Ugboma, HA., & Onyearugha, CN. (2013). Low birthweight delivery: prevalence and associated factors as seen at a tertiary health facility. *Niger J Clin Pract., 16*(2), 184-187.
UNHCR. (2013a). Stories from Syrian refugees. 22 July 2013, from http://data.unhcr.org/syrianrefugees/syria.php
UNHCR. (2013b). UNHCR leader warns of moment of truth for Syria, risk of unmanageable crisis. 27 February 2013, from http://www.unhcr.org/512e4f626.html
Van-Nguyen, JM. , & Abenhaim, HA. (2013). Sudden Infant Death Syndrome: review for the obstetric care provider. *Am J Perinatol, Jan 5*. .
Van-Sleuwen, BE. , L'Hoir, MP., Engelberts, AC. , Westers, P. , & Schulpen, TW. (2003a). Infant care practices related to cot death in Turkish and Moroccan families in the Netherlands. *Arch Dis Child, 88*(9), 784-788.
Van-Sleuwen, BE., L'Hoir, MP., Engelberts, AC., Westers, P., & Schulpen, TW. (2003b). Infant care practices related to cot death in Turkish and Moroccan families in the Netherlands. *Arch Dis Child., 88*(9), 784-788.
Vargas, SL., Ponce, C.A., Hughes, WT., Wakefield, A.E., Weitz, JC., Donoso, S., . . . Lopez, R. (2000). Association of primary pneumocystis carinii infection and sudden infant death syndrome. *Clin Infect Dis, 29*(6), 1498-1493. doi: 10.1086/313796
Vennemann, M., Bajanowski, T., & Brinkmann, B. (2009). Does breastfeeding reduce the risk of sudden infant death syndrome?. *Pediatrics, 123*(3), e406–410. doi: 10.1542/peds.2008-2145
Vennemann, M., Findeisen, M., Bahloul, T., Jorch, G., Brinkmann, B., Köpcke, W., & Mitchell, B. (2005). Modifiable risk factors for SIDS in Germany: Results of GeSID. *Acta Paediatrica, 94*(6), 655–660.
Wakefield, M., Loken, B., & Hornik, R. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261 - 1271.
WHO. (2009a). WHO report on the global tobacco epidemic *Appendix VII - Table, Age-standardized prevalence estimates for smoking, 2006*.
WHO. (2009b). WHO report on the global tobacco epidemic, 2009: implementing smoke-free environments Retrieved 3 October 2012, from http://www.who.int/tobacco/mpower/2009/appendix_vii/en/
WHO. (2012). Jordanian health statistic report. Amman, Jordan: Jordanian Health Organisation.
WHO. (2013a). Children: reducing mortality. Retrieved 10 Oct, 2013, from http://www.who.int/mediacentre/factsheets/fs178/en/
WHO. (2013b). *Jordanian national plan of action for children*. Amman, Jordan: Board National Affairs for Families in Jordan.
Wiesenfelder, H. (2011, 2011). What are the benefits of focus groups? Retrieved 13.5, 2011, from http://www.ehow.com/about_5042427_benefits-focus-groups.html
Wilson, L. (2008). *Sudden Unexpected Death in Infants (SUDI) and parental infant care: perspectives of general practitioners, nurses and parents living and working in the multicultural community of Western Sydney.* (PhD), University of Sydney., Sydney.
Wilson, L., Quine, S., & Lewis, M. (2010). Sleeping infants safely, considerations for GPs. *Aust Fam Physician, 39*(1).
Yikilkan, H., Unalan, PC., Cakir, E., Ersu, RH., Cifcili, S., Akman, M., . . . Dagli, E. (2011a). Sudden infant death syndrome: how much mothers and health professionals know. *Pediatr Int., 53*(1), 24-28.
Yikilkan, H., Unalan, PC., Cakir, E., Ersu, RH., Cifcili, S., Akman, M., . . . Dagli, E. (2011b). Sudden infant death syndrome: how much mothers and health professionals know. *Pediatr Int., 53*(1), 24-28.

Ziadeh, S. (2001). Obstetric outcome of teenage pregnancies in North Jordan. *Arch Gynecol Obstet., 265*(1), 26-29.