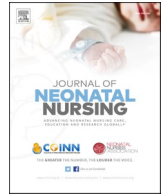




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## Skin-to-Skin Contact. Are we doing enough?

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## ABSTRACT

Skin-to-Skin Contact (SSC) (also known as kangaroo care) is a fundamental aspect of neonatal care globally for both term and preterm infants. Yet there seem to be barriers to facilitating this in clinical practice, some of these barriers will be explored in this article. This article will explore the practice of SSC in the UK, Rwanda, Zambia and Saudi Arabia. Education is crucial to support and enhance clinical practice. The use of simulation to improve confidence and knowledge when initiating SSC for a preterm ventilated baby was a useful learning activity that has increased confidence. The benefits of SSC are well known internationally by healthcare professionals. Overall, the reasons/barriers for not facilitating SSC seem to be very similar in the UK and internationally. This shows that there is a requirement for further education and training globally. As much as we consider SSC as a simple practice, there are times when this cannot be as easy as expected. Low staffing levels play a major part in the UK and internationally, with patient safety being a top priority. If more staff were available, would SSC be encouraged more? Further research is required into the barriers to SSC and parental knowledge of SSC. Will the recommended continuous or even the minimum 8 hours per day of SSC ever be achievable globally?

## 1. Introduction

Skin-to-Skin Contact (SSC) (also known as kangaroo care) is a fundamental aspect of neonatal care globally for both term and preterm infants. SSC should be commenced within the first 24 hours of life and offered continuously or for a minimum of 8 hours per day (Hall et al., 2024). Yet there seem to be barriers to facilitating this in clinical practice, some of these barriers will be explored in this article.

SSC is where a baby is placed directly onto a caregiver's chest and can be initiated straight after birth or at any time the baby needs soothing (WHO, 2022; UNICEF, 2024). On the neonatal unit SSC facilitates bonding and enhances the physical and developmental outcomes for the baby. SSC is also a requirement of the Baby Friendly standards (UNICEF, 2024). The World Health Organisation (WHO) (2022) recognise the importance of SSC for the survival of both small and preterm babies. This reinforces the importance of this aspect of care for all infants on the neonatal unit. Although the WHO (2022) recommendations

have relevance in poorer settings that may not have access to high-tech equipment, they are also relevant for high-income countries. This article will explore the practice of SSC in the UK, Rwanda, Zambia and Saudi Arabia.

Education is crucial to support and enhance clinical practice. The use of simulation to improve confidence and knowledge when initiating SSC for a preterm ventilated infant will be explored.

## 2. Physiological benefits of SSC

Touch is one of the first senses to develop and therefore SSC with the newborn is important to give comfort and security as well as regulating body temperature. It also induces relaxation and reduces the stress hormone cortisol through the release of oxytocin and stabilises key observations such as breathing, oxygen saturations and heart rate. Oxytocin is an important hormone for bonding and triggers key emotional centres to be highlighted in the brain of both mother and

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baby. Touch also means that the baby is colonised with friendly bacteria from the maternal and paternal skin giving protection from infection. SSC releases oxytocin which is also important to stimulate digestion and breastmilk production and ejection. SSC has been shown to promote growth and reduce the time spent in hospital (UNICEF, 2024). Through SSC parents can become more responsive to their baby's behavioural cues.

### 3. A clinical perspective of current practice in the UK

SSC is a fundamental part of the neonatal journey for both the infant and family. We know that there are many benefits including reducing parental stress, increasing ability to produce breast milk and a general increase in parental competence (Clarke et al., 2021). Working clinically for several years I have witnessed the barriers and limitations to facilitating SSC. This includes a lack of staff able to facilitate safely, confidence of the parents and stability of the baby. Previous experience of SSC is also an important consideration, as if the parents have had a negative previous experience, they may be reluctant to have their baby out in the future in fear the same may happen. Once a baby is receiving intensive care there is a range of equipment that will be in place and as discussed in Clarke et al. (2021) cuddles can become logistically more challenging as the lines, wires, and monitoring cause physical barriers which explains why the first cuddle may not happen for many weeks.

The process needs to be controlled and requires at least two experienced staff members to assist, the aim is to make it a positive experience for both the parent and baby with limited stress. According to the British Association of Perinatal Medicine (BAPM) (2010) within intensive care the minimum nurse to baby ratio should be 1:1 and these nurses should be qualified in speciality (QIS). The reality is that there are not adequate numbers of QIS nurses to achieve these requirements. If this standard was met the appropriate number of nurses would be available to support SSC. The most recent data from 2022 shows that the number of Neonatal Nurse shifts that were adequately staffed with QIS trained nurses was 71.1% showing a decline for the second year in a row (National Neonatal Audit Programme, 2022). Although the staffing is not always adequate for the team to offer SSC within my unit over the last 5 years staff have become more comfortable getting ventilated babies out for SSC. Where at all possible nursing staff will offer this regularly to families and plan the day to facilitate SSC. I have been involved with simulations enabling junior staff new to intensive care to practice in a controlled environment getting a ventilated patient out of the incubator, arranging wires, ventilation tubing, and ensuring both baby and parent are comfortable.

To address some of the above issues and enable SSC earlier, studies have been conducted and training implemented to facilitate delivery room cuddles (DRC) for extreme preterm infants where possible. A randomised control trial around DRC was conducted in Germany and it was found that there was an improvement of maternal wellbeing and quality of attachment behaviour without an increase in short term complications associated with prematurity (Kimkool et al., 2022). Within the last couple of years, I have seen an increase in DRC which has played an important role in trying to make a very stressful situation more positive for the parents. In the past parents would have had their baby shown to them briefly on the resuscitaire before they were taken to the neonatal unit, the implementation of DRC has meant that these families can have 5–10 minutes of quality 'family time' which they would have if their baby had been born at term. Within this time staff often take family photos and it gives time for the Neonatal team to briefly update the parents and inform them of what will happen next. Without these opportunities being available to families in some circumstances parents would only be asked to hold their baby when they are at the end of their life. When babies become unwell the opportunity to offer cuddles is limited as discussed in Bates et al. (2019), if we facilitated DRC for all babies at the start of their life it would mean for the few that do not survive the only parental cuddle is not at the end of their life. This will have a positive impact on the lifelong memories for

these families.

As a neonatal nurse in the UK, I have seen SSC used in many different areas and for different reasons. Following delivery, if the infant does not require any interventions, then SSC is offered and encouraged with the mother. This is encouraged for at least the first hour after birth or until the first feed. Once on the postnatal ward SSC does not seem to be common practice or encouraged. Barriers I have noticed are mostly due to low staff levels and staff not having enough time to support mothers and their newborns.

When an infant is on the neonatal unit, SSC is offered but not as often as it could be. Many people have the mindset that SSC is for premature infants, however there are many benefits for term infants as well. Sick infants in intensive care and their parents will benefit strongly from SSC, however this is also seen as a barrier. Parents are often too scared to hold their baby, especially if they are premature or have a lot of lines and breathing assistance. Nurses and doctors also use this as a reason not to offer SSC. Some infants are very unstable so cannot always have SSC, but due to staff and parental anxiety a lot of infants that could, don't. Once out of intensive care and moved to special care, infants are dressed, and SSC is rarely seen. This may be due to the effort of having to undress and redress the infant each time and the lack of privacy for the parents. There is not a lot of education or training on SSC specifically. It tends to be built into other training, which is mostly lecture based and not hands on.

### 4. International perspectives of SSC

#### 4.1. UK and Zambia

As a neonatal nurse from the UK, I have worked in all areas of neonatal care including, neonatal units, postnatal wards, labour wards and neonatal transport. Since 2018 I have been working and volunteering in Zambia within neonatal units and labour wards. One main area of care that we see across the world when caring for sick and premature infants is SSC or KMC (Kangaroo Mother Care). SSC goes back many years and is a simple but very effective part of neonatal care. There is not necessarily a financial need for equipment, or other resources and it is known to help improve survival of infants, especially when born prematurely. So, for low resource settings such as Zambia, this is a perfect way to care for infants at birth and on the neonatal unit, yet there are many barriers to this and it does not always seem to be common practice, practical issues do need to be considered (Hall et al., 2024). Even within the UK, this is not always common practice, and we should be seeing less barriers than what we see in Zambia.

Whilst working in Zambia, I have spent time on neonatal units, labour wards and postnatal wards. Most of my maternity experience has been in health care clinics rather than the hospitals, however the care is similar across all hospitals and clinics within the country. Midwives, nurses and doctors have very good knowledge of SSC and its benefits, however through all areas of maternity and neonatal it is not common practice. On labour ward, SSC is done for the first one minute of life, whilst drying and stimulating the infant during deferred cord clamping. However, this seems to be where it stops within maternity services, with each infant being dressed and away from the mother for the majority of the first hour of life. The main barrier for this is the temperature of the delivery room, the stability of the mother as there is no pain relief when requiring suturing and the mothers are walked to the postnatal ward as soon as they have delivered/been sutured. There is no SSC following delivery or on the postnatal ward, as they are encouraged to keep the infants dressed due to the concern of hypothermia, which is a common problem within Zambia's newborn infants. Also, I feel the staffing levels within the maternity services are a barrier.

I have not observed SSC done on neonatal units; however, mothers come to breastfeed their infants and are encouraged to wear a gown so there is some skin contact during the breastfeed. This would be a perfect opportunity to promote SSC bonding for at least one hour. If the infants

are tube fed or nil by mouth, then no SSC is seen at all. I have witnessed preterm infants on fluids that would benefit from SSC and the mothers are discouraged from even picking up their infants. Unwell infants are not allowed to be held; however, we have seen an improvement within Zambia in sick infants' conditions when they have SSC with their mothers. The high number of incidences of hypothermic infants in Zambia is a main reason that SSC is not encouraged, however we also know that this is the best way to keep an infant warm, especially in a developing country that has no other heat source. This shows that there is a lot of work that needs to go into continuous and regular SSC, no matter how easy and simple we may think it is. Other reasons included the mother not being well enough, but it has been shown that SSC also has benefits when done with the father or other family members, which does not seem to be well understood.

Despite all these observations, all neonatal units I have visited have a separate KMC ward or bay, where mothers stay 24 hours a day with their stable preterm infants and have skin to skin most of the time. This is a great idea and works well, so needs to be encouraged on all other infants.

#### 4.2. Zambia, UK and Saudi Arabia

It is amazing how such a small act can change the entire neonatal care. As an experienced international nurse, having worked in South Africa (ZA) and in Saudi Arabia (SA), I've never, in my career experienced such intense skin to skin practice especially on very sick neonates, that is, with an endotracheal tube (ETT) in situ. In ZA SSC was carried out on stable ventilated patients. In SA, I had never seen any SSC being practiced. I always wonder if culture, cannot say religion as it doesn't have any effect in the UK or ZA, has an influence in implementing SSC in SA or if it's the language barrier as most healthcare workers are foreign nationals.

#### 4.3. Zambia

The Women and Newborn Neonatal Unit is the highest level of care in the country receiving referrals from across the country and contributes the highest perinatal and neonatal mortality nationwide.

Neonatal mortality rate is at 27/1000 live births with the highest causes of mortality being Asphyxia, Prematurity and Sepsis (Zambia Demographic Health Survey (ZDHS), CSO, 2019). Approximately 60% of all babies nursed in this unit are referred from other facilities within the Lusaka district. These babies arrive in a poor state of hypoxia, hypothermia and respiratory problems. The Ministry of Health has a legacy goal of reducing the neonatal mortality from 27/1000 live births to 12/1000 live births as prescribed by the Sustainable Development Goal Number 3 (SDG - 3) (UN Zambia, 2024). Therefore, a number of measures such as early Continuous Positive Airway Pressure (CPAP), use of ante-natal steroids, infection prevention and SSC have been put in place to avert preventable deaths.

The workload and staff to patient ratios are high as shown in Fig. 1 below.

Ministry of Health (2018) is now advocating for Zero separation keeping the mother and baby together. Due to overcrowding in the NICU and following a situation analysis in Lusaka District 18th-25<sup>th</sup> May 2020

to identify space for KMC to be used as a step down. Space was identified and KMC units were setup for stable/pre-terms with mild RDS between 1300g and 1449g as follows in Fig. 2.

The impact of the KMC units in the district and across the country has been positive and includes: reduced length of stay in the hospital/increase in discharges, reduction in the referral of preterm infants to the tertiary hospital, reduced stress in the mother, improved family centred care/Male involvement, increased confidence in handling the baby (in the mom), mom feels part of the care/decision making, reduced workload on the overloaded nurses, reduction in sepsis due to minimal handling, reduction in apnoea and improvement in the distress, temperature regulation and stabilisation is improved, feeding enhanced, reduction in preterm deaths, and happy mothers satisfied with the care.

Current practice in relation to SSC is improving, National guidelines on KMC have been produced by the Ministry of health (2018) and the new approach iKMC has been formulated and awaiting to be rolled out/implemented. Prolonged KMC 12–14 hours in 24 hours for Intermittent "iKMC" units (8 Incubators with 8 KMC beds) has commenced. Intermittent KMC 30–40minutes every 2 hours for high-care patients. Continuous KMC for regular KMC unit (35 Beds space) commenced.

Future prospects include Currently working on Immediate Kangaroo Mother Care (iKMC) Standard of Practice (SOPs), Working on NICU Protocols and SOPs (Group of Doctors and Nurses), Functionalise the KMC units in the periphery (Nurse led/driven KMC units) and Work on the discharge SOP from higher level to lower-level hospital KMC unit which is proximal to the mother's home.

The challenges faced are:

1. Increase in the disease burden
2. Inadequate ante-natal Care Services
3. Delay in seeking medical Care, accessing and receiving care
4. Inadequate skilled manpower
5. Inadequate equipment such as CPAP Machines and CPAP sets
6. Inconsistent supply of caffeine Citrate
7. Inadequate space
8. Overcrowded units
9. Inadequate skills in managing preterm infants

#### 4.4. Rwanda

With my experience of working in the NICU if SSC is done well then it will give a good effect by, growth of small premature baby, it will prevent infection to premature baby, if a premature baby has instability, a premature baby is restless it will help the baby to be calm, if premature baby has low temperature SSC will help to stabilize that. As it is very hot in our country during SSC the body temperature of the baby can become high due to SSC. SSC carried out by the mother creates a good affinity with the baby you see mom she became happy, she started to say that she has hope of surviving of her baby, and we see her starting to produce more breast milk compared to before.

In our country doctors and nurses are very serious by encouraging parents for SSC because they notice there are good results with SSC. We are there to teach parents about the benefits of that, myself if I see those parents that are intellectual I tell them to go and search about SSC. I

Ward	Number of babies admitted/seen	Nurse patient ratio (includes mechanically ventilated babies)	Doctor patient ratio-icu	Nurse patient ratio high care	Doctor patient ratio –high care
NICU	87-125	1:17/ 1:26	1:10	1:20/1:42	1:12
KMC	30-35	n/a	n/a	1:20/1:35	1:30/1:35
Clinic	26-40 /week	n/a	n/a	1:14/1:20	1:14/1:20

Fig. 1. Workload and staff-to-patient ratios.

Facility name	capacity
Chipata level 1 hospital	6
Kanyama level 1 hospital	6
Levy Mwanawasa hospital	12
Misisi mini hospital	4
Chelstone first level hospital	4
Women and newborn hospital	35

Fig. 2. Facilities with KMC units in Lusaka district.

explain to the father that before it was kangaroo mother care because it was done by mothers only but this time it is done by everybody even the father. For twins and triplets we explain to both parents that babies need SSC and better to be done by both parents because one of them cannot be satisfied.

In our country we start SSC once the baby is stable in our NICU, once baby is stable even if still need N/CPAP we explain the parents that baby need SSC and then help them to put baby on skin, we adjust the circuit of the machine and baby is under monitoring and if no problem SSC can be done for more than two hours.

## 5. The impact of education and simulation

Students attending their QIS course reported feeling nervous in relation to facilitating SSC for ventilated preterm infants. They reported that lack of exposure, knowledge and confidence were reasons for this. For this reason, a simulation of SSC of a preterm ventilated infant was developed. There is evidence that simulation enables students to practice clinical skills in a protected environment (Koukourikos et al., 2021). The use of a protected environment enhances students' confidence and learning (Koukourikos et al., 2021). Students were placed into small groups with different levels of experience to enhance social constructivism learning from a more experienced other (Liu and Chen, 2010).

I did not have much confidence in offering SSC to parents with very sick neonates before the simulation which made it look so easy and very possible. Not to mention, the happiness it brings to both the infant and the parent. The fear has always lied in accidental extubation or that the neonate's condition may worsen. A primary fear is not having enough staffing to implement it safely. After the simulation, I have found confidence in offering SSC to parents with very sick neonates with the confidence that, there's always someone willing to assist and that it is beneficial to the infant's wellbeing. That simulation may seem minor to experienced individuals in SSC but, to me, I would label it 'a game-changer'. I learnt how to allocate roles when moving an infant from the bed to the parent, how to open the incubator, where to position the parent, how to secure the tubes on or around the parent and infant head positioning on the parent's chest or arms while ensuring that the endotracheal tube remains in position.

The students reported that this simulation was a useful learning activity that has increased their confidence. However, they also reported that they would feel more confident with adequate staffing levels to promote safety.

## 6. Conclusion

The benefits of SSC are well known internationally by healthcare professionals. Overall, the reasons/barriers for not facilitating SSC seem to be very similar in the UK and internationally. This shows that there is a requirement for further education and training globally. As much as SSC as a simple practice, there are times when this cannot be as easy as expected. Low staffing levels play a major part in the UK and internationally, with patient safety being a top priority. If more staff were available, would SSC be encouraged more? When SSC is done, it is vital

that the mother's temperature is stable and that the room is an acceptable temperature. This means ensuring there are no draughts, there are heat sources available and thermometers to check both mother and infants' temperature. If these resources are not available, which seems very common in Zambia, then it makes the situation a lot more difficult. SSC can and should be encouraged everywhere, however, at times, there are barriers, whether they are easy to overcome or not this needs to be addressed in all situations. Simulation has been successful in improving confidence and demonstrating safe practice. Further research is required into the barriers to SSC and parental knowledge of SSC. Will the recommended continuous or even the minimum 8 hours per day of SSC ever be achievable globally?

## Declaration of competing interest

I can confirm that there is no conflict of interest.

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