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Kangaroo Care: Experiences and Needs of Parents in Neonatal Intensive Care: A Systematic Review 'Parents' Experience of Kangaroo Care'

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Abstract

This review is focusing on the experiences and needs of parents with infants within NICU regarding Kangaroo Care. Ten studies with qualitative designs were included. Kangaroo Care was overall experienced as positive; giving parents the opportunity to get to know their babies and (re-) construct their parenting role. Parents need potential barriers like communication, support, environment and physical needs to be facilitated in a way that they contribute to a positive experience.

Keywords: Experiences; Kangaroo care; Needs; NICU; Parents

Abbreviations

KC: Kangaroo Care; NICU: Neonatal Intensive Care Unit

Keynotes

- Parents experienced kangaroo Care as positive. It gives parents the opportunity to get to know their babies and (re)construct their parenting role.
- Information and communication of nurses, support of partner and family, Parents' physical needs and obligations and the NICU environment can act as barriers.
- Nurses are the designated persons to improve all external factors experienced as barriers in order to improve the KC performance.

Introduction

Every year, around 15 million babies are born preterm, which is more than one in ten babies. Over one million of them die, due to complications of their preterm birth [1]. Preterm birth is defined as a birth with a gestation of less than 37 weeks [1]. Prematurity has both short- and long term risks to health [2-6]. Because of the critical health state of preterm infants, infants are separated from their parents' quickly after birth and transferred to a neonatal intensive care unit (NICU). A NICU is fully equipped with trained health care workers and specialized technology to give preterm infants the best possible care to survive [1,7,8].

Preterm birth affects parents. It is often experienced as a traumatic event which changes parents' perceptions and triggers their coping resources and a range of emotional, physical and behavioral responses [6]. Parents are overwhelmed by technology, medical terms, the NICU environment and lots of conflicting emotions [6,8,9].

Preterm birth also affects the parenting-role. They became parents, but are not able tot take care of their infants. They have to rely on strangers for their infants' well being. Parents experience a sense of helplessness, since they are unable to hold or touch their infant, take care of them, help and protect them and relieve pain [6,7]. They also experience the NICU environment as a barrier for bonding with their child [7,10,11]. Family centered care and involving the parents in the care for their infants as soon as possible helps them (re)construct their role as parents. It gives them the feeling of doing something meaningful for their infant [6,12,13].

An intervention that is developed to give parents the opportunity to participate in the care for their infant and to stimulate the attachment process is *Kangaroo Care* (KC). Kangaroo Care is introduced as an evidence-based nursing practice in neonatal care. While performing KC, the infant is put on the bare chest of the parent in a prone position and covered with cloths, allowing intense skin-to-skin contact. This meets the infants and parents needs for warmth, love and contact [14-16]. Research has shown positive results of KC physically and mentally, for both infants [17-20] and parents [16, 21-23].

However, research shows that parents initially are ambivalent to KC. An ambivalence involving a yearning to have their infant close as well as a fear of hurting the infant [9,10,16]. This ambivalence can work as a barrier for performing KC, as well as several other factors like technical equipment, privacy and support [7,24,25]. NICU health care workers, especially nurses, have an important role in anticipating on and the elimination of those barriers and the stimulation of the performance of KC [12,16,24]. To do this, nurses need to have insight in these barriers and in the experiences and needs of parents with respect to KC so that they can involve this insight in daily care. This will contribute to and stimulate the performance of KC which is important because without KC, the positive effects for both parents and infants will also not occur [14,16,24]. Research has been done to set forth the experiences of parents with respect to KC. However, it lacks a clear overview of all the relevant information for nurses, which makes the results less accessible for implementation in practice.

Therefore, a systematic review is performed with the aim to provide an overview of the literature focusing on the experiences and needs of parents with infants on a NICU with respect to Kangaroo Care.

Methods

Data sources

A systematic review was conducted according to the method of the Cochrane Handbook for Systematic Reviews [26] and following the steps of the PRISMA statement [27]. The literature search was conducted between February and July 2014. The following databases were searched; PubMed, Cochrane Library, CINAHL and PsychINFO. The reference lists of selected studies were hand searched to identify additional references. The field "title and/or abstract" was selected.

Search method

A search string is composed based on the research question. The complete search string, for pubmed, including Mesh terms, was as follows: *Parent* OR "Infant, Premature"[Mesh] OR "Infant, Extremely Premature"[Mesh] OR infant* OR "preterm infant*" OR preterm OR neonat* OR "nm OR "neonatal intensive care unit" OR nicu OR family* ***AND*** *"Kangaroo-Mother Care Method"[Mesh] "Kangaroo care" OR "Skin-to-skin care" OR "Kangaroo mother care" OR "Kangaroo method"* ***AND*** *Experience* OR Needs OR Expectation* OR Emotion* OR "Emotional experience" OR Perception OR View OR Information OR factors OR Participation OR Barriere* OR Problem* OR Communicat* OR Bonding OR Attachment OR Support OR Accompaniment OR Involvement OR "Parental involvement" OR "Parental participation".*

Study selection

Studies were found eligible for inclusion if they met the following criteria: 1) Including parents with infants on a NICU; 2) Focusing on the KC intervention; 3) Qualitative or mixed-methods design and 4) Published in English. Studies meeting the following criteria were excluded: 1) reviews; 2) Quantitative design and 3) Published before January 2004.

Studies were selected following the next steps: searching databases; removing duplicates; screening titles and abstracts; obtaining full-text articles; screening full-text articles and selecting articles to include in the systematic review.

Data extraction

The following study characteristics were recorded using a data extraction form: Study/research aim, study design, data collection, participants and results.

Methodological quality

The methodological quality of all studies selected for inclusion was evaluated by two independent researchers (KG and JM). Consensus was reached by discussion of the discrepancies. Since all included studies were qualitative, the CASP (qualitative research checklist) was used for assessing the methodological quality [28]. This appraisal tool consists of ten questions regarding methodological quality with each several sub questions which can be answered with "Yes", "No" or "Can't tell". However, for the appraisal in this review the questions were answered with "+" meaning yes, "-" meaning no or can't tell and "+/-" meaning partially present, since this last option was missing in the original checklist. The total scores were assessed as follows. A plus is worth one point, a plus/minus half a point and every minus zero points. The maximum achievable score is ten times a plus, ten points. All selected studies received a final grade between zero and ten points.

Results

Study characteristics

As presented in the flow chart [Figure 1], a total of ten studies were included in this systematic review. Data was extracted of the full-text articles and noted on a data extraction form [Table 1].

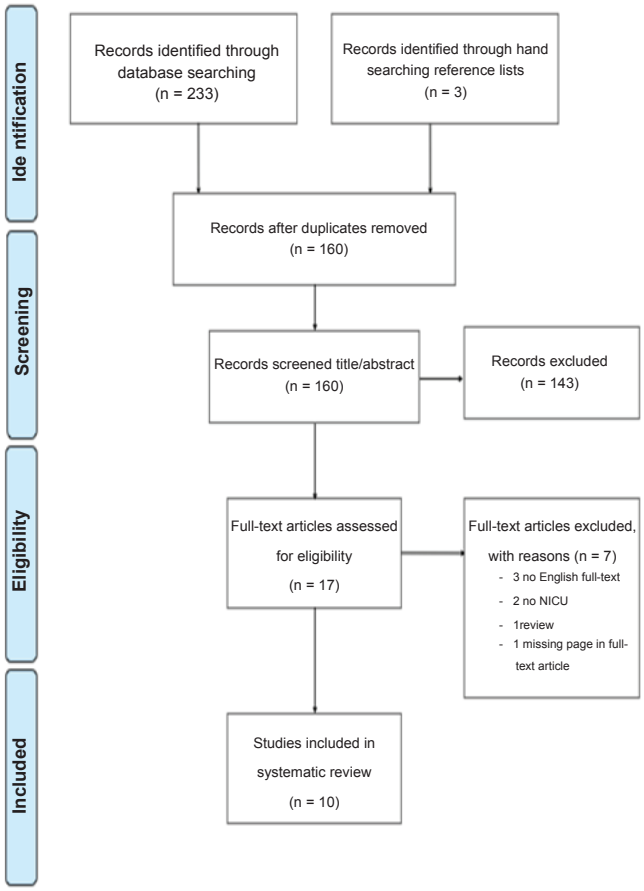
All studies focused on the experiences of parents and therefore used a qualitative design. Six used a descriptive, qualitative design [11,13,16,29,33,34], Three a phenomenological approach [30-32] and one a retrospective survey design [24].

The studies had a total of 270 participants, consisting of 168 mothers and 102 fathers. Four studies focused only on mothers [24,31,33,34], two on fathers [13,30] and four on both mothers and fathers [11,16,29,32].

Three studies used open interviews for collecting data [16,32,33] and four used semi-structured interviews [13,29,31,34]. One study used a combination of semi-structured interviews and participant observation [30] finally, two studies used questionnaires [11,24].

Methodological quality

The final grades of the ten included studies for methodological quality varied between six and nine of the possible total of ten points (Table 2). These grades were found to be sufficient. However, there were some comments and remarks to make. Two studies used questionnaires for answering the qualitative research question, which limits sufficient in-dept data to emerge [11,24]. Also, two of four studies that used semi-structured interviews did not discuss the questions they asked [13,31]. Finally, most of the studies did not discuss or provided limited information about the relationship between researcher and participant, which is important for qualitative research when using CASP [11,13,24,30-34].



Flow chart 1: Flow chart of selected studies

Study/Research aim	Quality appraisal	Study design	Data collection	Participants	Results
Heinemann et al. Sweden (2013) Explore parents' experiences of factors in neonatal intensive care unit that made it easier, or more difficult, for them to stay with their extremely preterm infant in an open bay neonatal intensive care room.	9	Descriptive, qualitative, design	Semi-structured interviews	7 mothers 6 fathers	– Support as partners and from family and staff is important; – Adequate information about infants' condition, caregiving activities and expectations important; – Opportunity to stay overnight made it easier; – Breastfeeding activities are experienced as stress ; –.Meaningful task, gave a sense of calm and relaxation; – KC strengthened motivation to be with the infant, and decreased the parents' sense of helplessness and redundancy; – Important component in the process of becoming a parent; – Unscheduled medical procedures and staff workload experienced as obstacles; – Level of activity and noise in NICU stressful and disturbing; – Technical equipment annoying and caused practical problems; – Having siblings and other obligations at home experienced as a challenge.
Roller et al. United states (2005) Aim: – Gain understanding of mothers' experiences of KC for their preterm newborns	9	Transedental phenomeno-logical design	Semi-structured interviews	10 mothers	– Expressed unpleasantness related to equipment in the NICU; – Nicu staff experienced as a barrier for getting to know their baby; – Reassurance and concrete information from nurses experienced as very important; – KC experienced as a wonderful and pleasant way to get to know their babies; – KC experienced as a warm, calming, positive, bonding experience, KC calmed jittery babies and themselves; – First felt some tense and uncomfortable, but feelings passed with each experience and they started to get to know their babies.
Lemmen et al. Sweden (2013) Aim: – Describe parents' experience of information and communication mediated by health care staff before and during KMC at neonatal units	8,5	Descriptive, qualitative design	Open interviews	12 mothers 8 fathers	– Becoming familiar with KC leads to great desire of being involved in their infants care; – As information and communication on KMC was clear, and the staff nurses were safe and unanimous in applying the method, the experience of KMC resulted in a strongly positive experience; – Participating in the care was experienced as very satisfying, helped feeling as a parent; – Not receiving information about physiological effects of KC for the infant experienced as a disappointment; – Practical information about eating, drinking, toilet and being comfortable before KC is important; – Fathers experienced KC as tedious, but reading or watching TV helped; – Sometimes fathers felt excluded because information was only given to the mothers; – Experience of fear of harming the infant during KC; – Each medical device that was discontinued made it easier, calmer and cosier to provide KC; – Mothers experienced KC more positive if the fathers were also present during KC; – Parents needed attention and guidance from the staff to overcome their ambivalent feelings for their infant.
Leonard et al. South Africa(2008) Aim: – Explore parents'lived experience of providing KC to their preterm infants	8	Phenomeno-logical design	Open interviews	4 mothers 2 fathers	– High-tech equipment as a barrier; – Ambivalence: Desperately wanting to hold their infant, but fear of hurting them; – The more KC, the more confident in caring for their infant; – KC facilitated a special connection. Helped getting to know them. Returns role of primary caregiver; – Physical closeness during KC enhances the parents' awareness of their infants' cues and signals. – Fathers experienced more barriers than their partners, because of privacy, work, and a different parenting role. – Supportive partners, family and other parents are vital. –; – Sense of accomplishment as the infant responded physically well to KC.
Blomqvist et al. Sweden (2011) Aim: – Identify factors parents perceived as supportive factors or barriers for their performance of KMC and explore reasons for discontinuing KMC	7,5	Descriptive, qualitative design	Questionnaire – 2 open ended questions – 2 closed questions	76 mothers 74 fathers	– Support of other parent, family and NICU staff important; – Enough time, helped; – Way of being close with infant, infants not being dressed and positive effects on infant felt supportive; – NICU routines, staff attitudes and lack of information perceived as barriers; – Parents' physical limitations and needs experienced as barriers; – Being single parent and desire of spending time on their own experienced as barriers; – Commuting between home/work and NICU and other siblings at home experienced as barriers; –Medical equipment, experienced as barrier; – Limited facilities, NICU sound level, lack of privacy and inappropriate furniture experienced as barriers.

Blomqvist et al. Sweden (2012) Aim: – Describe fathers' experiences of providing KMC their preterm infants with KMC	7,5	Descriptive, qualitative design	Individual semi-structured interviews	7 fathers	– Sharing care with partner and help from family members important; – KC gave a role as a parent, made feel important and involved. Helped feeling as a father; – First experienced as difficult, later on more natural and confident; – Fathers performed KC with big motivation,; – Own physical needs irritating and difficult, KC could be demanding, stressful and exhausting; – Sometimes felt isolated, locked up and tied down. Possibility for doing other things during KC helped a lot; – Physical environment influenced the opportunities and experiences of KC; – Conflicting staff statements and behavior experienced as a barrier..
Helth et al. Denmark(2013) Aim: – Explore how fathers of premature infants experience and potentially benefit from using STS method during their infants admission to the NICU.	7	Hermeneutic phenomeno-logical design	Individual semi-structured interviews	5 fathers	– Experienced as a unique opportunity to play an important role in their child's life; – The more specific Information and knowledge regarding KC the more and competent the fathers felt; – Learning about and performing KC gave fathers practical competencies regarding their infant; – Being treated as an equally important parent as the mother by the staff very important; – KC felt as being able to protect their infant and provide comfort; – Leaving the hospital for work felt bad, but also gave the opportunity to re-charge; – KC enhances fathers an understanding of their own role as a father.
Neu et al. United states(2004) Aim: – Describe factors that influence mothers of healthy preterm infants to choose kangaroo holding or blanket holding	7	Naturalistic inquiry design	Open interviews	24 mothers	– Discomfort and anxiety because of wires, tubes and fear of physically hurting the infant; – Feeling hesitation to ask assistance from nurses, did not want to bother them; – Lack of facilitation for holding, inconsistent opinions and directions and nurses always seemed busy; – Hospital environment obstructive: lack of privacy, noise, personal staff conversations and high activity level; – Mothers were determined to pracice KC, regardless of environment or assistance; – Perceived emotional benefits of holding, unique feeling, getting connected; – Reducing anxiety about holding would enhance the mothers to perform KC; – Main motivation to start KC were perceived benefits for the infants; – Building a trusting relationship and providing individualized attention important for al mothers.
Blomqvist et al. Sweden (2013) Aim: – Characterise the first infants treated with continuous KMC , investigate aspects of the practical application of KMC and explore mothers' experiences of this new model of care during the implementation period.	6,5	Qualitative, retrospective survey design	Chart review of infants medical records Questionnaire – 24 closed questions – 1 open-ended question	17 mothers	– KC made the mothers feel important and competent as caregivers; – Liked to have the infant close, felt safe and natural. Did not feel apprehension or stress; – Unsatisfied with staff: inadequate information and communication and changing attitudes and routines during different shifts; – Negative environment experiences: Small rooms, uncomfortable furniture, technical equipment; – Breastfeeding in combination with KC experienced as stressful and exhausting. Also inadequate support from nurses; – Routines for postpartum care of mothers rooming-in were missing; – Having other siblings at home experienced as a real problem.
Johnson et al. United states (2007) Aim: – Describe the maternal experience of KMC in the NICU to gain insight into specific maternal benefits of this intervention	6	Naturalistic inquiry design	Semi-structered interviews Participant observation as complete observer	18 mothers	– Mothers felt KC was important for their infants and the nurses, gave satisfaction; – KC was heartwarming in many ways; – First feeling scared and nervous, later confident; – Made the mothers more patient with their support persons; – Information and guidance from nurses experienced as essential; – Mothers comfortable with KC regardless of the physical health status of the infant; – Creating privacy is very important,; – KMC gave mothers a feeling of connectedness to their infants and teaches them how to be a mother. Increases confidence in mother role.

Table 1: Data extraction form KC, Kangaroo care; NICU, neonatal intensive care unit.

Data synthesis

Studies were too heterogeneous to pool data. Therefore, the results are presented in a narrative way using two sub headings wherein they logically address the research question; Parents' experience and Parental needs, each containing four primary themes.

Results of individual studies

While analyzing the extracted data in detail, eight primary themes could be identified. These themes are; (1) Confidence, (2) Physical effects, (3) Bonding, (4) (Re-) constructing parenting role, (5) Information, communication and support of nurses, (6) Support of partner and family, (7) Parents' physical needs and obligations and (8) NICU environment. Parts of the data from the selected studies were found to fit in to multiple themes. This data is added to the theme where it fitted most. The eight themes are described below, using the data from the ten included studies.

Parents' experience: Parents' experience refers to the feelings and experiences of parents during the performance of Kangaroo Care. It contains the subheadings Confidence, Physical effects, Bonding and (Re-) constructing parenting role.

Confidence: Once parents start applying the KC method, they seem to experience ambivalent feelings. They desperately want to hold their baby, but are also nervous, scared, tense, and have fear of hurting the baby

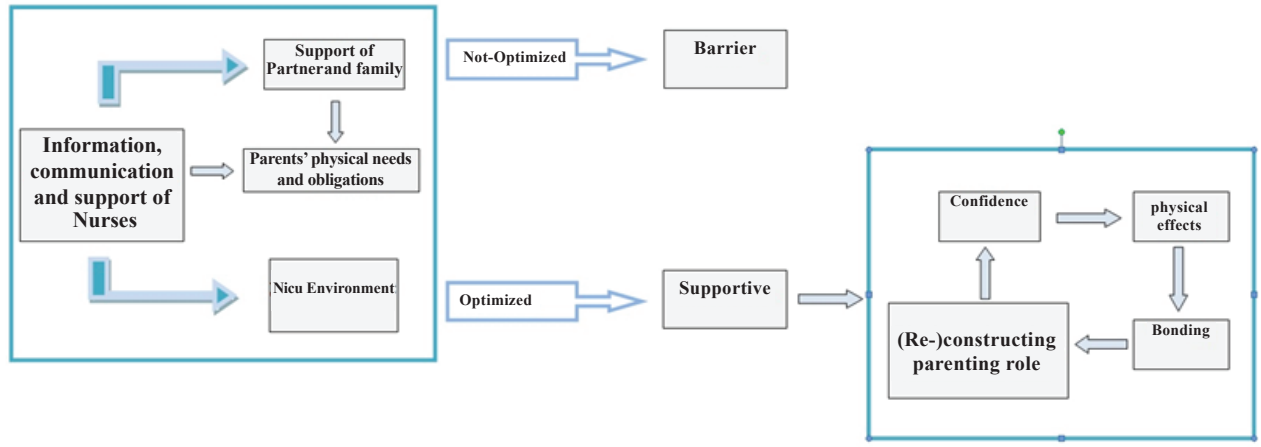


Figure 1: Model improving Kangaroo Care experience

	Blomqvist et al. (2011)	Blomqvist et. al. (2012)	Blomqvist et al. (2013)	Heinemann et al. (2013)	Helth et al. (2013)	Johnson et al. (2007)	Lemmen et al. (2013)	Leonard et al. (2008)	Neu et al. (2004)	Roller et al. (2005)
1. Was there a clear statement of the aims of the research?	+	+	+	+	+/-	+/-	+	+/-	+/-	+/-
2. Is a qualitative methodology appropriate?	+	+	+/-	+	+	+	+	+	+	+
3. Was the research design appropriate to address the aims of the research?	+/-	+	+/-	+	+/-	+/-	+/-	+	+	+
4. Was the recruitment strategy appropriate to the aims of the research?	+/-	+	+	+	+	+/-	+/-	+	+	+
5. Was the data collected in a way that addressed the research issue?	+/-	+/-	+/-	+	+	+	+	+	+	+
6. Has the relationship between researcher and participants been adequately considered?	-	-	-	+	-	-	+	-	-	+/-
7. Have ethical issues been taken into consideration?	+	+/-	+/-	+/-	+	+/-	+	+	+/-	+
8. Was the data analysis sufficiently rigorous?	+	+	+	+	+	+	+	+	+	+
9. Is there a clear statement of findings?	+	+/-	+	+	+/-	+/-	+	+/-	+/-	+
10. How valuable is the research?	+	+	+/-	+/-	+/-	+/-	+/-	+	+/-	+
Total	**7,5**	**7,5**	**6,5**	**9**	**7**	**6**	**8,5**	**8**	**7**	**9**

"+" meaning yes; "+/-" meaning partially present; "-" meaning no/can't tell

Table 2: CASP checklist for qualitative research – Qualitative appraisal tool

[13,16,31,32,34]. However, those feelings decreased with every experience of KC and the parents became more and more confident as they continued applying KC [13,16,30-32,34]. Decreasing anxiety by giving specific information and knowledge would enhance the performance of KC and increases parents' confident [30,33].

Physical effects: Main motivation for starting KC is the perceived physical benefit for the infant [30,33]. Mothers in the study of Johnson et al. [34] felt comfortable with performing KC regardless of the infants physical health status and felt that it was important for their infants. Parents experienced a sense of accomplishment and satisfaction when they noticed their infants responding positively to KC [11,30-32,34]. Some parents experienced positive effects on themselves, like a sense of calm and relaxation [29,31].

Bonding: KC strengthened the parents motivation to be with their infants [13,16,29]. They experience KC as a positive, wonderful, pleasant, natural and heartwarming way of being close with their infants [11,13,24,29,31,34]. It felt as a meaningful task that facilitated a special connection with their infants and helped getting to know them and be part of their lives [29,31-34]. Some parents experienced that by performing KC, they became aware of their infants' cues and signals, which gave them practical competencies in caring for their infants [30,32].

(Re-) Constructing parenting role: Being able to perform KC decreases parents' sense of helplessness and redundancy. It made them feel important, gave them a sense of purpose and returned their role as primary caregiver [11,13,16,29]. They suddenly are able to protect their

infant and provide comfort [11,30]. Participating in KC is experienced as an important, satisfying and unique opportunity to play a role in their infants lives and made them actually feel as parents [13,16,29,30,34]. Fathers experienced more barriers then mothers in providing KC due to work, privacy and differences in naturally set gender roles [13,30,32]. Fathers sometimes felt excluded and being treated as an equally important parent by nurses is very important for them [16,30,32].

Parental needs: Parental needs refers to the external factors that are found to be either barriers or supportive and influence the parents' experience of Kangaroo Care. It contains the subheadings Information, communication and support of nurses, support of partner and family, parents' physical needs and obligations and NICU environment.

Information, communication and support of nurses: Parents were not often satisfied with the presence of the nurses at the NICU. There were often inconsistent and conflicting staff statements and behaviors and changing attitudes and routines during different shifts which is experienced as a barrier for performing KC [11,13,24,32]. Inadequate or lack of information, communication and support is also experienced as a barrier of KC [11,16,24,31,32]. Mothers in the study of Neu et al. [33] felt hesitation to ask assistance since nurses always seemed busy and they did not want to bother them. However, lack of assistance did not withhold them from performing KC. Parents needed to receive adequate, clear and concrete information and communication about expectations, their infants' condition and care-giving activities [16,29,31,34]. They also felt that the opportunity to build a trusting relationship with nurses, receiving adequate support of nurses and nurses being unanimous in applying the KC method is very important and influenced their KC experience positively [16,24,29,31,33,34].

Support of partner and family: Support from partner and family members is experienced as essential as it gave the opportunity to share feelings, fears and emotions and to help each other with daily activities [11,13,29,32]. Therefore, being a single parent is experienced as a barrier for the performance of KC [11]. Mothers in the study of Lemmen et al. [16] experienced a KC session as more positive if the fathers were also actually present. Mothers in the study of Johnson et al. [34] reported being more patient with their support persons after they started applying KC.

Parents' physical needs and obligations: Parents experienced that KC could be stressful and demanding. They often suffer from anxiety, boredom, tiredness and backache [13,16,24,32]. Parents' own physical needs, like the needs to eat, drink, sleep and shower, are experienced as irritating and difficult and can be a real barrier [13,16,24]. KC could be tedious, but the opportunity for doing other things during KC sessions like watching TV or reading helped a lot [13,16]. Parents in the study of Lemmen et al. [16] reported that practical information about eating, drinking, going to the toilet and bringing something to do before starting a KC session is very valuable. The performance of breastfeeding was experienced as stressful and demanding and hindered the performance of KC [11,24,29].Creating privacy during KC is experienced as very important [24,33,34]. However, parents sometimes felt isolated and had a desire of spending time alone [13,16,24,32]. Therefore, leaving the hospital for other obligations was difficult, but also gave the opportunity to recharge [24,30]. Still, parents experience having other obligations at work or home and commuting between the hospital and home as a barrier for the performance of KC [11,24,29]. Especially having other siblings at home can be a real challenge [11,24,29,30].

Nicu environment: The NICU environment was mainly experienced as a barrier. The most important obstacle for the performance of KC was the high-tech equipment, tubes and wires connected to the equipment, which created discomfort and anxiety [11,16,24,29,32-34]. Parents in the study of Lemmen et al. [16] reported that every medical device that was discontinued made it easier to perform KC. Inappropriate and uncomfortable furniture and rooms were also experienced as barriers for KC as they made it hard to perform KC for a longer period of time [11,13,24,29,33]. The level of activity on the NICU and the sound level were found to be very disturbing, especially during the nights [13,24,29,33]. NICU routines, particularly unscheduled medical procedures, influenced the opportunity to perform KC [13,24,29,33]. Last, Mothers in the study of Blomqvist et al. [11] reported that post-partum routines for mothers who are rooming-in were missing.

Meta-synthesis

When evaluating the results, a pattern occurs (Figure 1). All experienced barriers are in a way traceable to the working method of nurses at the NICU. If conditions are not optimized, nurses act as barriers. But if conditions are optimized, nurses are experienced by parents as supportive. This creates a cyclical, self-reinforcing effect of a positive KC experience (Figure 1), which contributes to an increased use of KC, and in turn has many benefits for parents and infants.

Discussion

The findings of this systematic review, concerning the experiences and needs of parents with respect to Kangaroo Care, demonstrate a mainly positive experience. Despite ambivalent feelings before starting KC, parents are motivated to get involved in the care for their infants [13,16,30-34]. Their confidence increased as they became involved and experienced the emotional and physical positive effects of the KC intervention [11,13,16,29-34]. Parents experienced KC as a positive, wonderful and heartwarming intervention that facilitated a special connection with their infants(11,13,24,29-32,34). It felt as a meaningful task that gave them a sense of purpose and strengthened their role as primary caregiver. It made them actually feel they were parents, which was very important to them [11,13,16,29,30,34].

Several factors could be identified influencing the KC experience. For instance, support of partners and family is identified as being important and can act as a barrier if it is not present [11,13,16,29,32,34]. Inconsistent and conflicting staff statements and behaviors, changing attitudes and routines during different shifts and inadequate information and communication are experienced as barriers for performing KC(11,13,16,24,31,32). Parents need to receive adequate, clear and concrete information and communication from nurses and want to feel supported by them [16,24,29,31,33,34]. Parents' own physical needs and limitations can act as real barriers [11,13,16,24,29,32]. This also applies to having other obligations and having siblings at home [11,24,29,30]. Creating privacy during KC is experienced as very important [16,24,33,34]. Still, the NICU environment was mainly experienced as a barrier with obstacles like high-tech equipment, inappropriate and uncomfortable furniture and rooms, high level of activity and sound and disturbing NICU routines [11,13,16,24,29,32-34].

Some limitations of this systematic review need to be addressed. In most of the studies, the duration of the KC sessions is not included as a parameter, although duration of KC might influence parents' experiences and needs. A wide range is seen in the number of participants (5 to 150) whereas the studies do not discuss in any way if they fulfill the concept of data saturation. In addition, some results are supported by almost all of the included studies, while others are supported by only a few studies. This has to be taken into account when drawing conclusions. Generalizability of the results can be questioned because the selected studies do not represent all parts of the world but are predominantly conducted in Scandinavia and the United States. However, methodological quality of the selected studies was predominantly good.

The methodological quality of the review has some limitations. Although feedback was asked from a panel of researchers at several moments during the study, the search was conducted by a single researcher. In addition, the study was performed in a very tight timeframe. Strengths that need to be addressed are the quality appraisal of the selected studies which was performed by two independent researchers. Also, the review is conducted very systematically with a very thorough search of available literature which contributes to the reliability and reproducibility of the research.

Findings of this review showed that parents in the included studies expressed how important it is to be involved in their infants care, getting connected to them and to (re-)construct their parenting role. This importance is confirmed by other research [6,9,35]. The study of Franklin [36] described the special position NICU nurses have in the infants care and the close cooperation with parents, allowing them to facilitate the caring process in a way that it promotes the attachment process and stimulates the parenting role.

Parents expressed how the NICU environment is experienced as a barrier for the performance of KC, because of high-tech equipment, inappropriate and uncomfortable furniture and rooms, high level of activity, high sound level and disturbing NICU routines. This is confirmed in other research concerning the experience of the NICU environment in general [7,25,37].

One of the main issues expressed concerned information, communication and support of nurses. Parents needed these factors to be adequate supported. Studies on the nurses view, regarding the question if their parental support on a NICU is sufficient, showed that nurses think they provide adequate support and information to parents [38-40]. This means that there is a conflict in what nurses think they should provide and what parents feel they need and actually perceive, which results in dissatisfaction. Critically reflecting on the type and consistency of support and communication parents receive, is in line with parents' perceptions and needs which might enhance satisfaction.

The statements parents made separately from each other suggest that there might be differences in the experiences and needs between fathers and mothers. However, the focus of the included studies was not on the differences between fathers and mothers but on the KC experience in general. This makes it difficult to compare and draw conclusions with regard to this issue. Other research on this topic shows that fathers and mothers do experience the NICU in a different way [10,41,42]. More insight is needed on the differences in experiences and needs of fathers and mothers concerning the KC intervention so that nurses can adjust their actions to the needs of the individual parent.

Three studies in this review described how parents experienced breastfeeding as a barrier for the performance of KC [11,24,29], while no studies in this review described KC having positive effects on breastfeeding. This is in contrast with findings in other studies describing KC as having positive effects on the performance and duration of breastfeeding [20,43,44]. This difference in outcome might be explained by the fact that other studies used quantitative methods to measure the breastfeeding performance. Mixed-methods research could be interesting to determine why outcomes do not correspond with each other.

For daily practice, it is important to make nurses aware that they are the designated person to effectively apply the KC intervention. Nurses have a great influence on how positively parents experience the intervention and how well the parents cooperate in the performance of KC. Nurses should try to improve all external factors that are perceived to be barriers as well as possible in order to improve the KC performance. This involves providing adequate and consistent information, communication and routines. Furthermore nurses should give support and encourage parents and family. In addition nurses also should take care of a comfortable and quiet environment to ensure privacy.

To achieve this, nurses will need specific evidence-based guidelines and training for the use of KC. Stikes and Barbier [45] effectively used the plan-do-study-act model to implement and increase the use of the KC intervention. The framework encourages learning, reflection and validation throughout implementation and therewith contributes to the decrease in perceived barriers. Potentially, the results of this review can be integrated into the plan-do-study-act model and transformed into specific, evidence-based guidelines for the use of KC in practice. These guidelines can be implemented and therewith ensure that the intervention is applied consistently. This will enhance the performance of KC and contribute to a positive experience of the KC intervention for parents which in turn will ensure that the positive health effects of KC will also occur in the infants.

Future research is necessary to explore whether the integration of the results of this review into the plan-do-study-act model results in a useful and effective guideline which in turn results in an improved performance of KC in practice.

Conclusion

This systematic review was conducted in order to answer the question what the experiences and needs of parents with infants on a NICU with respect to Kangaroo Care are.

Parents experience Kangaroo Care as a unique, heartwarming, pleasant and positive intervention. It gives them the opportunity to get to know their babies and (re-)construct their parenting role, which is very important to them.

Several external factors influences the Kangaroo care experience. Information and communication of nurses, support of partner and family, Parents' physical needs and obligations and the NICU environment can act either as barriers or as supportive facilitators. Parents have a need for these factors to be present in a way that they contribute to KC performance. If that is the case, KC performance is experienced mainly positive and pleasant which motivates parents to continue. Nurses are the designated persons to improve all external factors experienced as barriers as well as possible in order to improve the KC performance. Specific evidence-based guidelines are needed to assist them in achieving this goal.

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