Knowledge of and attitudes to the practice of Kangaroo Mother Care (KMC) among staff in two neonatal units

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ABSTRACT

Aim: The aim of the study was to compare knowledge and attitudes towards Kangaroo Mother Care (KMC) among neonatal unit staff at two neonatal units 2008 and 2010. Method: Members of staff from two neonatal units completed a questionnaire with 22 statements and an open-ended question in 2008 and 2010. The data were analysed with Mann-Whitney U test and content analysis. Results: There were significant differences between unit A and unit B in both the 2008 survey and the 2010 survey, showing better knowledge of KMC and a more positive attitude to KMC in unit A. Content analysis of responses to the open-ended question revealed concerns in unit B that its care environment was not suitable for KMC. Conclusions: Hypothetically, the fact that staff in unit A work in facilities designed to facilitate KMC, receive training in KMC and practice continuous KMC in intensive care as well as in intermediate care, has resulted in good knowledge of KMC and a general improvement of staff attitudes to KMC. Keywords: Kangaroo Mother Care, neonatal staff, attitude, knowledge, preterm infants
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1 Background

Kangaroo Mother Care (KMC), also called kangaroo care or skin-to-skin contact, was initially developed in Colombia in the 1970s. Low birth weight and preterm infants who no longer needed intensive care were cared for skin to skin with their parents. More than 20 years of research and implementation in health care has shown that kangaroo care is more than just an alternative to incubator care. Kangaroo care is a beneficial method for bonding, breast-feeding and temperature control of all new-born infants, regardless of weight, gestational age and clinical condition (WHO, 2003, Charpak et al., 2005). In low-income neonatal units, the method is used 24h/day (continuous KMC), but in affluent settings with high-tech equipment, despite the evidence of the safety and positive effects of KMC, the method is usually implemented as shorter sessions (intermittent KMC). It has been recommended that staff initiate continuous KMC, even in a high tech-unit, as soon as possible after the infant is born and after initial resuscitation and stabilization (Nyqvist et al., 2010; Charpak et al., 2005). Staff must learn to meet the highly technical needs of today’s preterm infants, while at the same time responding to the parents’ need of emotional support and desire to be close to their infant (Fenwick, Barclay, Schmied, 2001).

Compared to traditional neonatal care, KMC yields instant physiological benefits for the preterm infant, such as thermal regulation (Bergman, Linley & Fawcus, 2004), more stable oxygen saturation in intubated infants (Gale, Franck, Lund, 1993), and less severe infections (Charpak et al., 2001). Furthermore, KMC has a positive effect on breastfeeding, especially for the smallest and most vulnerable infants (Flacking, Ewald, Wallin, 2011) and more quiet sleep has been identified in skin-to-skin holding infants comparing to traditional care (Feldman, Weller, Sirotta, Eidelman 2002a). It has also been shown to work as pain treatment, reducing the preterm infants’ pain and salivary cortisol during heel stick (Cong, Ludington-Hoe, Walsh, 2011). Moreover, KMC can help decrease the time during which the infant needs hospital care (Charpak et al., 2001).

Mothers who provided KMC for their premature infant in the neonatal unit have reported less depression and felt more competent and more responsible in their care for their infants (Feldman, Eidelman, Sirotta, Weller, 2002b; Tessier et al., 1998). Mothers who practiced
continuous KMC (24h/day) have reported that they liked having this close contact with their infant and that they felt safe with this care. However, some of the mothers were unsatisfied with the guidance and support offered by staff at the unit (Blomqvist & Nyqvist, 2010). Experiencing a feeling of subordination in relation to the staff at the neonatal unit can make mothers feel insecure in their relationship with their infant. Some mothers have felt replaceable as mothers. Becoming a mother in the neonatal unit is not only an issue of bonding with one’s infant. Becoming a mother is a process of social interaction with others, and for mothers of preterm infants these others include staff at the neonatal unit (Flacking, Ewald, Starrin, 2007).

It has been shown that the physical and social environment in most neonatal units does not convey signals to parents that invite them to stay with their infant. As parent-infant bonding is a primary goal, particular demands on staff will follow (Nyqvist et al., 2010). The nursing perspective incorporates the idea that, in the context of promoting health and preventing illness, the effect of the parent-child relationship on the child’s health needs to be understood (Lutz, Anderson, Riesch, Pridham, Becker, 2009). Therefore, KMC should be promoted actively and should be viewed as a means of humanizing the process of giving premature birth (Tessier et al., 1998).

However, the implementation of KMC seems to be an example of practice based on attitudes rather than scientific evidence (Engler et al., 2002), as the positive or negative attitudes of staff affect parental practice of KMC (Flynn & Leahy-Warren, 2010). Staff at neonatal units sometimes have concerns that KMC may be a burden for mothers, and may question whether KMC is useful, or even consider the method needless or insecure (Anderson, Chiu, Dombrowski, Swinth, Albert, Wada, 2003). Although the model is considered safe even for very low birth weight infants and infants who need mechanical ventilation (Bauer, Sontheimer, Fischer, Linderkamp, 1996; Ludington-Hoe, Ferreira, Swinth, Ceccardi, 2003) there are still concerns. Some members of the staff have concerns over whether KMC should begin within a few hours of birth (Chia, Gan, Sellick, 2006) and some have concerns for the safety of preterm infants (Flynn & Leahy-Warren, 2010; Engler et al., 2002; Mallet et al., 2007). Furthermore, staff has concerns over increased workloads and low staffing levels (Chia et al., 1996).

It has been found that a key factor in developing a positive attitude is that staff find the facilitation of KMC professionally satisfying. Members of neonatal staff expressed a sense of excitement and enthusiasm about using the method, which is an important aspect of the
implementing process (Chia et al., 2006). When staff observed the improved wellbeing of parents and preterm infants during KMC, it gave them motivation to work toward further improvement (Wallin, Rudberg, Gunningberg, 2005). Nurses at units in which KMC is practiced seem to have very positive perceptions about the method and are more open-minded in their opinion of which infants could be cared for with KMC. In addition, while they do perceive some disadvantages regarding KMC, this does not seem to affect their implementation (Engler et al., 2002).

Staff at neonatal units viewed education as essential in providing them with the knowledge and skill to facilitate KMC (Chia et al., 2006; Mallet et al., 2007; Nagorski Johnson, 2007). Neonatal units that established change teams, guidelines and information meetings for implementing KMC have thereby increased knowledge and have changed attitudes among staff (Wallin et al., 2005). Nevertheless, nursing staff that had completed training still needed time to become comfortable with the method (DiMenna, 2006; Nagorski Johnson 2007). However, knowledge and practice are not necessarily related: knowledge alone does not change practice. Attitudes strongly influence action (Engler et al., 2002). Even if staff are aware of research literature, their own personal knowledge and beliefs influence their encouragement or discouragement of KMC (Flynn & Leahy-Warren, 2010). Hence, nurses may be unwilling to implement new nursing care interventions, regardless of their demonstrated effects, if they do not perceive the value of the intervention (Engler et al., 2002).

Availability of family rooms, recliners or parent beds naturally affects parents’ presence in the neonatal unit, and thus the extent of their performance of KMC. This may also be reflected in how staff perceives the method. In connection with a research project on implementation of KMC in two Swedish neonatal intensive care units (NICUs) with differences in nursery designs and parents’ opportunities for staying over night, it was considered interesting to investigate staff knowledge of and attitudes to KMC before and after the period of data collection in order to describe possible effects of the study. The hypothesis was that knowledge and attitudes would have improved over time in both units.

1.1 Aim
The aim of the study was to compare knowledge and attitudes towards Kangaroo Mother Care (KMC) among neonatal unit staff at two neonatal units 2008 and 2010.
1.2 Research questions

With regard to knowledge and attitudes:
A. Were there differences between the respective units from the first survey to the second?
B. Were there any changes within units from the first survey to the second?
C. Which spontaneous comments about KMC did respondents give at the two measurements?

2 Method

2.1 Research design

A descriptive, explorative design was used, obtaining both quantitative and qualitative data. Quantitative data was obtained through a questionnaire of staff knowledge of and attitudes to the use of KMC in neonatal units. Qualitative data was obtained through an open question in the questionnaire. A prospective comparative design was used for comparison of data collected at two different time points.

2.2 Research settings

Unit A was a 23-bed NICU, including 14-beds for intensive care. In the NICU, parents had access to an adult bed beside their infant’s incubator or bed, enabling parents to stay with their infant 24h/day and to give continuous KMC. The unit also included 9 family rooms where parents (and siblings) could live with their infant 24h/day with support and medical care from staff. Infants who did not need intensive care would be treated with continuous KMC in family rooms from birth to discharge. Unit A provided a common kitchen and lounge for families and play areas for siblings. Maternity nursing care was provided in the neonatal unit, including the NICU, enabling nearly all mothers to stay with their infants to give continuous KMC.

Unit B was a 17-bed NICU, including 5-beds for intensive care. Remaining 12 beds were intermediate care beds for infants whose condition was more stable. Parents had access to a recliner beside their infant’s incubator or bed in both the NICU and in the intermediate care section. Moreover, unit B had two family rooms where parents could live with their infant around the clock for one or a couple of days just before discharge.
2.3 Sample

All registered nurses (RNs), physicians and assistant nurses working in two neonatal units in Sweden, units A and B, and in service at the time of data collection were asked to participate in the survey. In 2008, 124 questionnaires were distributed at unit A and 49 questionnaires at unit B. In 2010, 115 questionnaires were distributed at unit A and 50 questionnaires at unit B.

2.4 Sample characteristics per survey

2.4.1 Unit A 2008

There were 93 respondents: 8% (n:7) physicians, 39% (n:36) nurses (whereof 72% (n:26) had further training) and 54% (n:50) assistant nurses. 70% (n:65) of staff had worked for 10 years or more.

2.4.2 Unit A 2010

There were 85 respondents: 12% (n:10) physicians, 39% (n:33) nurses (whereof 67% (n:22) had further training) and 49% (n:42) assistant nurses. 69,4 % (n:59) of staff had worked for 10 years or more.

2.4.3 Unit B 2008

There were 44 respondents: 16% (n:7) physicians, 66% (n:29) nurses (whereof 97% (n:28) had further training) and 18% (n:8) assistant nurses. 63,6% (n:28) of staff had worked for 10 years or more.

2.4.4 Unit B 2010

There were 41 respondents: 15% (n:6) physicians, 61% (n:25) nurses (whereof 76% (n:19) had further training) and 24% (n:10) assistant nurses. 75,6% (n:31) of staff had worked for 10 years or more.
Table 1. Sample characteristics

<table>
<thead>
<tr>
<th></th>
<th>Section A 2008</th>
<th>Section A 2010</th>
<th>Section B 2008</th>
<th>Section B 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical KMC training</td>
<td>90%</td>
<td>89%</td>
<td>86%</td>
<td>58%</td>
</tr>
<tr>
<td></td>
<td>n: 84</td>
<td>n: 76</td>
<td>n: 38</td>
<td>n: 24</td>
</tr>
<tr>
<td>Practical KMC training</td>
<td>74%</td>
<td>75%</td>
<td>59%</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>n: 69</td>
<td>n: 64</td>
<td>n: 26</td>
<td>n: 21</td>
</tr>
<tr>
<td>Agreed that the unit had clear KMC guidelines</td>
<td>98%</td>
<td>98%</td>
<td>89%</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>n: 91</td>
<td>n: 83</td>
<td>n: 39</td>
<td>n: 35</td>
</tr>
<tr>
<td>Have read article</td>
<td>47%</td>
<td>37%</td>
<td>22%</td>
<td>42%</td>
</tr>
<tr>
<td>(popular scientific)</td>
<td>n:44</td>
<td>n:31</td>
<td>n:10</td>
<td>n:17</td>
</tr>
<tr>
<td>Have read article</td>
<td>32%</td>
<td>38%</td>
<td>55%</td>
<td>39%</td>
</tr>
<tr>
<td>(scientific)</td>
<td>n:30</td>
<td>n:32</td>
<td>n:24</td>
<td>n:16</td>
</tr>
<tr>
<td>Have read text book</td>
<td>30%</td>
<td>32%</td>
<td>34%</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>n:28</td>
<td>n:27</td>
<td>n:15</td>
<td>n:16</td>
</tr>
<tr>
<td>Have read on the Internet</td>
<td>33%</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n:28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.5 Data collection

A questionnaire was designed with reference to literature (Chia et al., 2006) and the clinical experience of the supervisor and a nurse with extensive experience in neonatal care. Before distribution, three persons reviewed the questionnaire; nurse, doctor and assistant nurse, from each unit (A and B) in order to secure its validity. Their suggestions for improvement were taken into account in finalising the questionnaire.

In the first section of the questionnaire, participants were asked to enter their profession and number of years in the profession. They were asked about theoretical and practical education in KMC and if they had read about KMC (scientific article, popular science article, textbook and/or internet). They were also asked whether their unit had clear guidelines on KMC.

The second section of the questionnaire consisted of 22 statements. Participants were asked to indicate their position on each statement using a scale with the endpoints 0 and 10, where 0 meant “Disagree” and 10 meant “Strongly agree” (Appendix 2). The statements concerned attitudes to the benefits of KMC, which children can be cared for with the method, perceived
security in the use of KMC, perceived drawbacks with this method, and level of education on KMC.
The third and final section consisted of an open-ended question, giving participants the opportunity of submitting free comments.

2.6 Data collection procedure
Authorisation for both studies was obtained from the medical director and nursing manager of each unit. Information on staff was collected from administrative assistants at each unit. A list of participants was compiled, and questionnaires were numbered with reference to the list, thereby making it possible to distribute reminders to queried persons who did not respond within the prescribed time. One reminder was sent and after that acceptable response rates were achieved. The list of participants was kept confidential and subsequently destroyed, making it impossible to connect questionnaires with participants.

Questionnaires were distributed at the respective work places (individual mail boxes/lockers) in the NICUs in September 2008 and December 2010. Questionnaires handed out in 2010 were identical to questionnaires used in 2008, save for an opportunity to indicate the Internet as a source of information on KMC in the 2010 questionnaire.

Participants who had not submitted their questionnaires in ten days were supplied with a new questionnaire, and asked to submit it no later than the last day of the month.

In the 2008 survey at unit A, 124 questionnaires were distributed and 93 questionnaires were returned, a response rate of 75%. At unit B, 49 questionnaires were distributed and 44 questionnaires were returned, a response rate of 90%.
In the 2010 survey at unit A, 115 questionnaires were distributed and 85 questionnaires were returned, a response rate of 74%. At unit B, 50 questionnaires were distributed and 41 questionnaires were returned, a response rate of 82%.

2.7 Data analysis
Answers (attitude indications) to the 22 statements were fed into a database and processed, using descriptive statistics. To compare the two units, Mann-Whitney U-test was used
(p<0.05). The software used was the Statistical Package for the Social Sciences (SPSS).

Free comments in response to the open question of the questionnaire were analysed using qualitative content analysis (Graneheim & Lundman, 2004). The first author read through all comments. Next, comments were divided into meaning units. The meaning units were condensed, and all authors formulated sub-categories and categories. The authors discussed and reflected on these and, finally, the findings were formulated in terms of sub-categories and three categories.

3 RESULTS

3.1 Differences between the two units at the two surveys and from the first survey to the second

Table 2. Staff knowledge of KMC in unit A and B in 2008 and 2010

<table>
<thead>
<tr>
<th>Question</th>
<th>Unit A 2008</th>
<th>Unit B 2008</th>
<th>P</th>
<th>Unit A 2010</th>
<th>Unit B 2010</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Md (range)</td>
<td>Md (range)</td>
<td></td>
<td>Md (range)</td>
<td>Md (range)</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. KMC promotes bonding</td>
<td>10 (7-10)</td>
<td>10 (7-10)</td>
<td>n.s</td>
<td>10 (5-10)</td>
<td>10 (7-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>2. KMC has a positive effect on physical wellbeing of infant</td>
<td>10 (5-10)</td>
<td>9 (5-10)</td>
<td>.003</td>
<td>10 (6-10)</td>
<td>10 (5-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>3. KMC has a positive effect on general condition of infant</td>
<td>10 (5-10)</td>
<td>10 (6-10)</td>
<td>.008</td>
<td>10 (5-10)</td>
<td>9 (6-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>4. KMC should not be practiced/ be avoided with an intubated infant</td>
<td>1 (1-10)</td>
<td>5 (1-10)</td>
<td>.000</td>
<td>1 (0-8)</td>
<td>5 (0-10)</td>
<td>.000</td>
</tr>
<tr>
<td>5. KMC should not be practiced/be avoided with an infant with umbilical catheter</td>
<td>4 (1-10)</td>
<td>2 (1-10)</td>
<td>n.s</td>
<td>2 (0-8)</td>
<td>3 (0-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>6. On-going Continuous Positive Airway Pressure (CPAP) is an obstacle</td>
<td>1 (1-10)</td>
<td>1 (1-8)</td>
<td>.010</td>
<td>0 (0-8)</td>
<td>1 (0-3)</td>
<td>.010</td>
</tr>
</tbody>
</table>
to KMC

| 7. KMC should not been introduced before 1 week if the infant is born less than 28 weeks of gestational age |
|---|---|---|---|---|---|
| 1 | 3 | n.s | 1 | 2 | n.s |
| (1-10) | (1-10) |  | (0-10) | (0-10) |  |

| 8. Stable infants should be introduced instantly after birth to KMC (if the infant is born after 28 weeks of gestational age) |
|---|---|---|---|---|---|
| 10 | 9 | .011 | 10 | 10 | n.s |
| (3-10) | (1-10) |  | (3-10) | (4-10) |  |

| 9. KMC leads to increased risk for the infant |
|---|---|---|---|---|
| 2 | 2 | n.s | 1 | 2 |
| (0-8) | (1-8) |  | (0-9) | (0-6) |

| 10. I consider I have enough theoretical knowledge about KMC |
|---|---|---|---|---|
| 8 | 6 | .000 | 8 | 6 |
| (1-10) | (1-10) |  | (0-10) | (2-10) |

| 11. I consider I have enough practical knowledge about KMC |
|---|---|---|---|---|
| 8 | 5 | .000 | 8 | 6 |
| (1-10) | (1-10) |  | (0-10) | (1-10) |

3.1.1 Knowledge

Staff at both units A and B, in 2008 as well as in 2010, agreed (high median score) that KMC promotes bonding.

On statements concerning the effect of KMC on the physical condition and general wellbeing of infants, there were significant differences between the units in the 2008 surveys. Staff members in unit A tended to have a more positive view of the impact of KMC in these regards. However, these significant differences between units A and B had disappeared in 2010.

With a few exceptions, staff at both units A and B, in 2008 and in 2010, was generally positive (low median scores) to practicing KMC even in view of safety concerns such as intubated infants, CPAP (Continuous Positive Airway Pressure), umbilical catheter, and infants born <28 weeks. There were significant differences with regard to practicing KMC with intubated infants and with infants in CPAP care in both 2008 and 2010, as staff at unit A was more positive in
each comparison. Staff did not agree (low median scores in both units in 2008 and 2010) with a general statement that KMC increases risks for infants, although there was a significant difference in 2010.

For stable infants born at >28 weeks, staff at both units in 2008 and 2010 agreed (high median scores) that KMC should be introduced instantly after birth. Still there was a significant difference in 2008, where staff in unit A was more positive to introducing KMC instantly. This difference had disappeared in 2010.

There were significant differences between units A and B with regard to staff’s self-valuation of theoretical and practical knowledge of KMC, as staff in unit A tended to value their knowledge higher than staff in unit B did. These significant differences were seen both in 2008 and 2010.

Table 3. Staff attitudes to KMC in unit A and B in 2008 and 2010

<table>
<thead>
<tr>
<th>Attitudes</th>
<th>Unit A 2008</th>
<th>Unit B 2008</th>
<th>p-value</th>
<th>Unit A 2010</th>
<th>Unit B 2010</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. KMC has a positive effect on parental self-confidence</td>
<td>10 (5-10)</td>
<td>9 (6-10)</td>
<td>n.s</td>
<td>10 (2-10)</td>
<td>9 (5-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>13. All parents should be encouraged to practice KMC</td>
<td>10 (7-10)</td>
<td>9 (1-10)</td>
<td>.000</td>
<td>10 (5-10)</td>
<td>10 (4-10)</td>
<td>.016</td>
</tr>
<tr>
<td>14. Parents can feel forced to practice KMC</td>
<td>6 (1-10)</td>
<td>5 (1-10)</td>
<td>n.s</td>
<td>5 (0-10)</td>
<td>5 (1-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>15. Potential benefits of KMC have been overstated</td>
<td>1 (0-9)</td>
<td>2 (1-8)</td>
<td>n.s</td>
<td>1 (0-9)</td>
<td>2 (0-8)</td>
<td>.001</td>
</tr>
<tr>
<td>16. Facilitating KMC is professionally satisfying</td>
<td>8 (0-10)</td>
<td>9 (2-10)</td>
<td>n.s</td>
<td>9 (1-10)</td>
<td>9 (4-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>17. KMC increases the workload for the staff</td>
<td>2 (1-9)</td>
<td>3 (1-10)</td>
<td>n.s</td>
<td>3 (0-9)</td>
<td>3 (0-9)</td>
<td>n.s</td>
</tr>
<tr>
<td>18. I encourage parents to practice KMC even if I consider that it increases the workload for the staff (compared with)</td>
<td>9 (1-10)</td>
<td>8 (1-10)</td>
<td>n.s</td>
<td>10 (0-10)</td>
<td>8 (0-10)</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>incubator care)</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>19. I consider I can observe the infant during KMC (equal to incubator care)</td>
<td>7.5 (1-10)</td>
<td>6 (1-10)</td>
<td>.039</td>
<td>7 (0-10)</td>
<td>6 (0-10)</td>
<td>n.s</td>
</tr>
<tr>
<td>20. It is suitable that parents practice KMC at night (family room)</td>
<td>9 (1-10)</td>
<td>6 (1-10)</td>
<td>.000</td>
<td>10 (1-10)</td>
<td>6.5 (0-10)</td>
<td>.000</td>
</tr>
<tr>
<td>21. It is suitable that parents practice KMC at night (open-bay)</td>
<td>9 (2-10)</td>
<td>5.5 (1-10)</td>
<td>.000</td>
<td>10 (1-10)</td>
<td>7 (0-10)</td>
<td>.000</td>
</tr>
<tr>
<td>22. Parents wish to practice KMC at night</td>
<td>6 (0-10)</td>
<td>4 (1-9)</td>
<td>.000</td>
<td>6 (1-10)</td>
<td>4 (0-8)</td>
<td>.000</td>
</tr>
</tbody>
</table>
3.1.2  Attitudes

Staff in both units A and B agreed (high median score) that KMC has a positive impact on parental self-confidence, in 2008 and in 2010. Staff in both units A and B in 2008 and 2010 agreed (high median score) that all parents should be encouraged to practice KMC, yet in both 2008 and in 2010, the staff in unit A was more positive to such encouragement. The median scores of staff attitudes to whether parents could feel forced to practice KMC were at medium level in both units in 2008 as well as in 2010.

Staff in units A and B did not agree (low median score) that the benefits of KMC have been overstated. In 2008 there was no significant difference between the units. In 2010, however, staff in unit A agreed to a lesser extent than they had in 2008.

With regard to the staff’s own experience of working with KMC, there was general agreement (high median scores) in 2008 and in 2010 that facilitating KMC was professionally satisfying. Staff did not agree (low median scores) that KMC increases their workload. Staff agreed (high median scores) that they would encourage parents to practice KMC even if they believed that KMC would increase staff’s workload. In this regard, however, there was a significant difference between units A and B in 2010, as staff in unit A was more positive to such encouragement. There was also a significant difference in 2008 in that staff in unit A tended to consider that they could observe infants in KMC to a higher extent than staff in unit B. This significant difference had disappeared in 2010.

On statements concerning practicing KMC during the night, there were significant differences between units A and B in 2008 as well as in 2010 with regard to all statements, covering KMC at night in family rooms and open bay, and whether staff believed that parents wish to practice KMC at night. Staff at unit A believed to a larger extent than staff in unit B, that it was suitable for parents to practice KMC at night, and that parents wished to practice KMC during nights.

3.2  Changes within units from the first survey to the second

The results were also analysed in order to reveal changes in attitudes at the respective Units (A and B) between 2008 and 2010.
3.2.1 Knowledge

In unit A, significant changes pertained to knowledge of the use of KMC in situations where there could be safety concerns (statements no. 4 (p=0.000), no. 5 (p=0.004), and no. 6 (p=0.000)), and of whether the use of KMC increases risks for the infant (statement no. 9 (p=0.002)). Responses showed that staff was more comfortable with the practice of KMC in the care of unstable infants in 2010 than it was in 2008, and that staff had become more convinced that KMC did not increase risks for the infant.

In unit B, significant changes pertained to knowledge of the use of KMC in situations where there could be safety concerns (statements no. 6 (p=0.002) and no. 7 (p=0.036)) and to one’s own practical knowledge on KMC (statement no. 11 (p=0.007)). Staff in unit B was more comfortable with the practice of KMC in the care of unstable infants in 2010 than it was in 2008, and valued their own practical knowledge of KMC higher in 2010 than in 2008.

3.2.2 Attitudes

In unit A, a significant change pertained to attitudes to whether the advantages of KMC have been overstated (statement no. 15 (p=0.000), where staff agreed to a lesser extent in 2010 than it had in 2008. There was also a significant change with regard to whether KMC is suitable in night-time care (statement no. 21 (p=0.043), with staff being more positive to KMC in night-time care in 2010 than it was in 2008.

In unit B, there were no significant changes pertaining to attitude statements.

3.3 Content analysis

Responses to the open-ended question were analysed and formulated into subcategories. These categories were divided into three categories: Safety concerns, Staff’s role and experience, and Staff’s perception of parents’ practice of KMC as described below. Results from the respective surveys are presented separately under each category.
3.3.1  Safety concerns

This category entailed five subcategories: Risks for the infant, The safety of the infant, The condition of the infant, Monitoring, and Position of the infant.

3.3.1.1  Unit A, 2008

Several comments regarded Risks for the infant, being concerned, for example, that intubated infants could be extubated when transferred or that there could be problems with umbilical catheters. Comments regarding The safety of the infant concerned issues such as the proper and safe use of KMC tops (special KMC garments). Comments on The condition of the infant focused on the level of stability of the infant needed in order to practice KMC, for example by pointing at risks for new-born infants <26 weeks. Some comments concerned Monitoring
problems, particularly in connection with KMC at night.

3.3.1.2 Unit A, 2010
Comments on Risks for the infant expressed concern for extubation of intubated infants, for catheter problems, and for risks for infants <26 weeks. There was one comment on The safety of the infant, emphasising that KMC tops should be used. Comments regarding The condition of the infant expressed that some infants are too unstable for KMC. There were differing views on Monitoring, as some commentators were concerned that parents could not observe their infant properly in some situations (such as at night and during tube feeding in KMC), while other comments expressed comfort in knowing that infants in KMC were continuously watched by their parents.

The infant is actually more monitored if they are lying with parents than in an incubator (where you don’t watch the infant all the time)

Comments on the Position of the infant focused on securing free airways for infants in KMC.

3.3.1.3 Unit B, 2008
There were no comments in this category in the 2008 survey in unit B.

3.3.1.4 Unit B, 2010
There was one response in this category, concerning Risks for the infant when the infant is intubated and is to be transferred. The commentator wished for further discussion on this.

3.3.2 Staff’s role and experience
This category entailed fourteen subcategories: Education, Experience, Attitudes, Care environment, Care routines, Work tasks, Workload, Staff cooperation, Information to parents, Assistance to parents, The well-being of the infant, Individual assessment, Benefits of KMC, and The concept of KMC.
3.3.2.1  Unit A, 2008

Comments on Education reflected that commentators wanted more knowledge and to keep their knowledge up to date, and that the unit should make an effort to meet this demand. With regard to Attitudes, some comments expressed uncertainty to the benefits and/or risks of KMC, while others expressed a positive attitude to KMC. With regard to Workload, some comments reflected concerns that KMC increased the workload of staff (for example as KMC led to difficult working postures, thereby increasing the work load), meanwhile some staff expressed that KMC did not increase the work load. One comment on Information to parents emphasised the role of information for successful practicing of KMC.

Often it is probably lack of info and support from staff that causes parents to do little KMC.

A few comments concerned special situations where KMC could decrease the Well-being of the infant. Comments on Individual assessment emphasised that it was necessary to decide in each individual case whether KMC is suitable or not.

3.3.2.2  Unit A, 2010

With regard to Education, commentators requested further knowledge with a view to being able to motivate parents to practice KMC. Comments on Attitudes reflected differing views in the staff, as some expressed dissatisfaction that not all staff members followed KMC guidelines or that some staff members preferred incubator care to KMC, while a few members of the staff expressed that KMC was being taken a step too far, paying little regard to the wishes of parents. On the Care environment, there were comments that the physical environment in the intensive care NICU, with the incubator in the center of the care space, did not invite parents to understand the importance of KMC, nor their importance as care givers. One comment on Work tasks expressed that KMC should be regarded as an every-day work task. With regard to Workload, no commentators considered that KMC increased their workload, except possibly when infants were transferred between parents and incubators, and, according to some comments, through difficult working postures.

Maybe only when the infant is to be taken up and back to the incubator. If the parents haven’t got used to helping out.
Several comments rather held that KMC decreased staff’s workload as parents learned to care for their infants. One comment on Staff cooperation emphasised the need for staff in the intensive care section and the family room section to work together so that parents who were transferred to the family room section were prepared to begin practicing continuous KMC. There was also one comment on Information to parents, concerning the role of information for successful KMC. One comment on Assistance to parents expressed that it is for the staff to support and help the family. On the Benefits of KMC, some comments expressed the importance of skin-to-skin care.

Fun to see that most infants are really so much calmer from being cared for in KMC – actually very natural – to be skin to skin.

There were also comments on the Concept of KMC, questioning terminology such as “sitting kangaroo”, “kangaroo”, and “kangaroo mother”.

3.3.2.3 Unit B, 2008

Some comments expressed a lack of Experience with KMC. The one commentator on Attitudes was concerned that KMC was being forgotten in the unit. 7 responses emphasised the need for a Care environment adapted to KMC, being unsatisfied with the facilities or staffing of unit B from this point of view, while one commentator expressed that there could be more practice of KMC in the facilities as they were.

Personally think we could do more than we are doing in the facilities we have but all staff don’t agree on that.

One comment on Care routines wished for coordinated KMC routines. There was one comment that Individual assessment is necessary, and one comment that the Benefits of KMC were not overstated.

3.3.2.4 Unit B, 2010

A comment on Attitudes expressed concern that views on KMC were differing among staff members. Comments on Care environment were concerned that unit B was not adapted to KMC, one comment focusing on the facilities and one on the position of recliners beside
incubators. One comment emphasised that although the Care environment was less than ideal, it was hoped that it would be improved.

We have not applied KMC for so long and not all the way (because of lack of facilities) therefore I have not that much practice yet but hope for it to come soon.

There was also one comment on Staff cooperation, according to which staff from the delivery ward sometimes disturbed parents in the unit.

3.3.3  Staff’s perception of parents practice of KMC

This category entailed six subcategories: Parenthood, Staff support, Practical help, Sensitivity, Coercion, and KMC at night.

3.3.3.1  Unit A, 2008

On the issue of Parenthood, comments emphasised the importance of closeness between parents and their infant, with some expressing that infants had a right to KMC even if parents were tired, or that fathers should practice KMC. Others emphasised the importance of parents being at ease with practicing KMC, or that parents could be frustrated if their infant did not react well to KMC. Comments on Staff support revolved around parents choosing if, and to what extent, they would practice KMC, and the confusion perceived in some parents (particularly fathers) as to whether they should be in the NICU, with their infant, or in the maternity ward. Some commentators considered it to be more difficult to motivate parents to stable infants to practice KMC. One comment on Sensitivity reflected that family rooms facilitated KMC as parents could be at ease with less clothes on. The issue of Coercion was addressed in some comments addressing pressure from staff on parents to practice KMC. Comments on KMC at night differed, with some being positive while others were concerned that parents would be exhausted if they slept too little.

3.3.3.2  Unit A, 2010

On Parenthood, some comments focused on the needs of families, for example if there were older siblings, and some on the importance of parents for their infant. With regard to Practical help, comments focused on efforts to ease the stress felt by parents. There was one comment on
Sensitivity towards parents, making them comfortable. Some commentators were concerned that there was Coercion, in that parents were forced to practice KMC. One comment gave the opposite view, noting that the infant was forced to be cared for somehow.

It’s hard to know if they feel forced but the infant is "forced" to be cared for somehow. Think most parents understand that they are better than a pulse-smell-and love free incubator.

Comments on KMC at night differed, with some emphasising the need for parents to sleep, while others emphasised the free choice of parents or the difficulty of knowing what parents wanted.

3.3.3.3 Unit B, 2008
On Parenthood, one comment considered that some parents were unable to practice KMC. Comments also stressed Sensitivity so that parents did not experience Coercion to practice KMC.

You need to be sensitive if the parents don’t want to use KMC as much as the staff thinks.

On KMC at night, it was noted that not many parents stayed the night.

3.3.3.4 Unit B, 2010
There was one response in this category submitted by staff. On Staff support, it was commented that fathers could be unable to practice KMC in the first hour if they were too worried about the mother.

4 DISCUSSION
4.1 Method discussion
The content validity of the questionnaire was established before a final version was created. Reminding participants to submit their questionnaires contributed to adequate response rates. The reliability of the surveys could be affected by mechanisms such as the Hawthorne effect,
i.e., that people who are participating in a scientific study will change their behaviour when they know that they are being observed (Polit & Beck, 2012). To secure reliability, participants were informed that questionnaires were filled in anonymously and that they had the right to refrain from submitting their questionnaire without being obliged to give reasons. Possibly, reliability would have been even more enhanced if questionnaires had been distributed and collected electronically via participant’s e-mail addresses. Yet, there could have been a problem with an electronic survey as not all staff members use e-mail.

In unit A, the response rate was lower than in unit B, both in 2008 and in 2010. Nevertheless, the response rate in unit A was acceptable both years. The staff that did not answer the questionnaire were mainly nurses and assistant nurses which may have influenced the results.

4.2 Results discussion

In general, the surveys in both units in 2008 and 2010 show good knowledge of KMC and positive attitudes towards practicing KMC. Nevertheless, there was a number of significant differences between the units, as staff in unit A tended to value their own knowledge of KMC higher than staff in unit B, and as staff in unit A were more positive to KMC than staff in unit B. In all, there were 12 such significant differences in the 2008 surveys and 11 such significant differences in the 2010 surveys.

4.2.1 Knowledge

Overall, staff in units A and B in 2008 and in 2010 agreed that KMC has positive effects for parent-infant attachment (bonding), for the physical wellbeing of the infant, and for the general condition of the infant. These are well-known benefits of KMC for preterm infants and their mothers (Feldman et al., 2002; Tessier et al., 1998), and similar results have been seen in other studies (Flynn & Leahy-Warren, 2010; Chia et al., 2006; Mallet et al., 2007).

The knowledge of staff on practicing KMC for unstable infants is a crucial point. Questionnaires focused on KMC and safety concerns in statements concerning KMC and intubated infants, umbilical catheter, CPAP, and infants born <28 weeks. The results of this study showed significant differences between units A and B in both 2008 and 2010 with regard to KMC for intubated infants and infants in CPAP care. Hesitance towards KMC for intubated
infants has been seen in other studies (Engler et al., 2002; Flynn & Leahy-Warren, 2010; Franck, Bernal, Gale, 2002). However, research by Ludington-Hoe et al. (2003) show no obstacle to KMC with intubated infants if the unit has clear guidelines on how to handle the intubated infants during KMC.

Research shows that concerns for safety risks in relation to KMC may be overestimated (Bauer et al., 1996; Ludington-Hoe et al., 2003). Therefore, it is important to reaffirm that KMC is beneficial for the infant and for parent-infant attachment. Nurses who seemingly provided solely infant-focused care, which was aimed at “protecting” or safeguarding the infant, reinforced feelings of disconnection and guilt in mothers (Fenwick et al., 2001). Ideally, staff should view parents as the primary care providers, and work to facilitate the parents’ close contact with their infant. Therefore, it is important that staff is perceptive to the needs and wishes of parents and make all possible efforts to cooperate with them.

There were significant differences between the staff’s self-valuation of theoretical and practical knowledge of KMC, between unit A and B in 2008 and 2010. Knowledge is important for KMC implementation (Nagorski Johnson, 2007). Staff needs to have knowledge about how to practice KMC safely and effectively, but knowledge alone not necessarily change practice (Engler et al., 2002) and therefore units should give their staff education about KMC but should also practice KMC on a regular basis.

4.2.2 Attitudes

Staff in both units, in 2008 and in 2010, agreed that all parents should be encouraged to practice KMC and that KMC has a positive effect on parental confidence. Staff’s agreement about positive effect on parental confidence has also been shown in another study (Chia et al., 2006). Staff at neonatal units sometimes have concerns that KMC may be a burden for mothers, and may question whether KMC is useful, or even consider the method needless or insecure (Anderson et al., 2003). This seems to be mirrored in the fact that some staff in both units A and B were concerned that parents could feel forced to provide KMC. Such a concern is problematic when contrasted with the high agreement among staff that KMC has positive effects for parent-infant attachment, for the physical wellbeing of the infant, and for the general condition of the infant. However, it has been reported that parents who practiced continuous KMC (24h/day) throughout the period of care in a neonatal unit did not feel forced to provide
KMC and would not have wished for any other care method to be used in the unit (Blomqvist & Nyqvist, 2010). Therefore, it seems to be an issue of great interest for nursing research to investigate further why staff believes that parents can feel forced to provide KMC and how staff can gain confidence in themselves and in parents with a view to improving the implementation of KMC.

Staff at both units A and B agreed that it is professionally satisfying to facilitate KMC. This is a key factor of the implementing process according to Chia et al. (2006). Moreover, staff did not agree that practicing KMC increased their workload. In other studies, staff has identified a heavy workload as an obstacle to the implementation of KMC in the NICU (Chia et al., 2006) although research by Ludington-Hoe et al. (1994) show that KMC does not significantly increase nurses’ workload.

The 2008 and 2010 surveys both show significant differences between units A and B with regard to staff attitudes to KMC in night-time care. Unit A had actively facilitated for parents to provide KMC for stable infants in a private family room. Night staff would support parents and might, at the request of parents, help tube feed their infant. The primary goal was that infants should be provided continuous KMC, practical assistance being perceived as a means to that end. Night-time KMC had not been an opportunity in unit B, with the exception of the two family rooms for infants who were to be discharged shortly. These facts account for great differences in the experience of night-time KMC among staff in the respective units, which could explain the significant differences in attitudes to night-time KMC. If this assumption is correct, it seems to follow that when staff gain experience of implementing KMC in night-time care as well as day-time care, attitudes to night-time KMC change into being more positive. Research has shown that preterm infants slept more during KMC (Ludington-Hoe et al., 1994, Feldman et al., 2002) which may assist the infant to weight gain and growth and the infants neurobehavioral outcome (Smith, 2002). Therefore, it is crucial that staff at neonatal units understand the importance of practicing KMC at night.

### 4.2.3 Content analysis

In unit A, in 2008 and in 2010, most comments concerned the Workload, Attitude and of Parenthood.
Most commentators expressed the view that KMC did not increase their workload, but some felt that working positions were bad with KMC and that this constituted an increased workload.

Comments on the attitudes of staff revealed differing views on the role of KMC in neonatal care, as some expressed that KMC could be taken too far while others submitted that KMC was a natural part of neonatal care, questioning that some staff members preferred incubators. Good support from staff is important for parents, in order to have the energy to practice KMC (Blomqvist & Nyqvist, 2010). Training staff to be more attentive, supportive and motivating can be a step on the way to helping parents and their infants to practice continuous KMC.

Comments on parenthood considered KMC to be important from a family care perspective, and the right of infants to be with their parents. The knowledge that the infant needs to be close to their parent, and also that parent want to feel close to their infant and separation from the infant is stressful (Lindberg & Öhrling, 2008) is a key point for the staff when implementing KMC. Research has shown that it is important to let the mother be “in charge” and reconstruct the client as the “mother-infant dyad” rather than just focusing on the infant (Fenwick, Barclay, Schmied, 2008).

Surveys in unit A resulted in far more comments in the Safety concerns category in 2008 than in 2010. Hypothetically, this can be explained with staff having gained more experience of working with KMC, and thus having become less concerned with safety issues. Previous research has shown that staff are less concerned with safety issues in connection with KMC if they have experience of working with KMC (Engler et al., 2002).

In unit B, in 2008 particularly but also in 2010, most comments dealt with issues connected with the care environment and the experience of staff. Several commentators expressed that the facilities in unit B were not adapted to the practice of KMC and/or that staffing was not sufficient for KMC. Some considered themselves to have too little experience of working with KMC to respond properly to the questionnaire used, especially the questions about KMC at night.

The view that staffing must be adapted in order to enable KMC to be practiced is interesting when compared to what was expressed by several staff members in unit A with regard to their workload, namely that KMC did not increase staff’s workload. Some comments from unit A
rather considered KMC to decrease staff’s workload, as parents would be more actively involved in the care of their infants.

Several comments in unit B expressed hopes for improved facilities, enabling the unit to get started with continuous KMC. Yet, an important comment expressed that KMC could be practiced to a greater extent already, notwithstanding a flawed physical environment, indicating that the problem was attitudes of staff rather than facilities.

In the 2008 survey in unit B, half the total amount of comments submitted to the open-ended question addressed issues connected to the care environment in the unit. This preoccupation with the care environment was not paralleled in the surveys in unit A. It has been shown that the physical structure of the ward is an important means of inviting and encouraging parents to provide KMC for their infant (Nyqvist et al., 2010). The neonatal units in which this study was conducted had different physical designs. Unit A had endeavoured to create a family-centred physical environment with a view to promote continuous KMC, even in the NICU. In unit A, there were parent beds beside incubators in the NICU and family rooms for all infants who did not need intensive care, whereas in unit B there were recliners beside incubators and infant-beds in both the NICU and in the intermediate care section. Thus, the physical environment in unit A was designed to show parents, in a concrete way, that they were needed in the unit as care providers for their infant, to build parental self-confidence as care providers, and to invite parents to provide continuous KMC. Nevertheless, one comment from staff in Unit A indicated a desire to make the intensive care section even more family-centred, by putting the family-bed in the middle of the ward and moving the incubator to the side.

Notwithstanding the importance of a physical environment adapted to the practice of KMC, successful KMC also needs knowledge and positive attitudes.

5 Conclusions

There were significant differences between unit A and unit B in the 2008 surveys and the 2010 surveys both, showing more knowledge of KMC and a more positive attitude to KMC in unit A. Hypothetically, the fact that staff in unit A work in facilities designed to facilitate KMC,
receive training in KMC and practice continuous KMC in intensive care as well as in intermediate care, has resulted in a general furtherance of knowledge on KMC and a general improvement of staff attitudes to KMC.

Results of the content analysis of the open-ended question indicate a clear difference between units, where staff in unit B are concerned with flaws in their care environment while such concerns are almost non-existent in answers submitted by staff in unit A. Nevertheless, a flawless care environment does not automatically lead to successful KMC, as staff must also have necessary knowledge and good attitudes to be able to encourage parents to practice KMC and to implement KMC at the unit.
6 References

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