TITLE: A meta-ethnographic synthesis of fathers' experiences of the neonatal intensive care unit environment during hospitalization of their premature infant.

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ABSTRACT

Objective: To undertake a synthesis of existing qualitative findings about fathers' experiences of the neonatal intensive care unit (NICU) environment.

Data Sources: Relevant key terms including *preterm, father, and NICU* were used to search the databases of CINAHL Plus, Academic Search Premier, MEDLINE and PsychInfo.

Study Selection: Only primary qualitative studies were included. Papers were excluded which did not focus on the NICU environment.

Data Extraction: Twenty-four studies were included. All authors critically appraised and extracted data relating to fathers' experiences in the NICU using an agreed data extraction form.

Data Synthesis: Primarily guided by Noblit and Hare (1988), the study findings were synthesized by translating the initial concepts and findings from an identified key paper into the data from the remaining 23 studies. Initially this was done separately by each author followed by further group discussion and synthesis. Emergent themes were proximity, parental autonomy, vulnerability, communication and exclusion and isolation.

Conclusions: The needs of fathers to interact and be involved with their infants care is a prominent factor enhancing their experiences in the NICU. Staff in the NICU can play a key role in facilitating this interaction through encouragement and reassurance.

KEYWORDS: Fathers, NICU, experiences, meta-ethnography

Callout 1: Fathers are important participants in the care of their infants, yet the experiences of fathers with an infant in the NICU are not well understood.

Callout 2: Fathers reported being unable to exercise their rights to care for, hold, and make decisions about their own infants.

Callout 3: Fathers in the NICU need consistent encouragement and reassurance from staff to promote interaction with their infants.

Preterm births are described as live births prior to week 37 of pregnancy (World Health Organization, 2013). Globally, 11.1% infants were born prematurely in 2010 (Blencowe et al., 2012). The rate of preterm births in the United Kingdom is approximately 8 per cent (Royal College of Obstetricians and Gynaecologists (RCOG), 2014), while in the United States this rate is considerably greater at approximately 11% (450,000 premature births) (Centers for Disease Control and Prevention (CDC), 2014). It is estimated that in the United Kingdom an infant is admitted to the neonatal intensive care unit (NICU) every six minutes (Bliss, 2014). Data from the United States indicate that in 2006, 77% of very low birth weight infants born required admission to the NICU (CDC, 2010).

The NICU can be an intimidating environment adding to parental distress following a preterm birth. Jamsa and Jamsa (1998) found that technology in the NICU had a negative influence on parents' experiences, citing the wires, tubes, and lights as well as the audible sounds as oppressive and frightening. Other researchers found that technology can negatively affect parental attachment. Moehn and Rossetti (1996) found that from a paternal perspective, the perceived fragility of the infant compromised their interactions. Bialoskurski, Cox, and Hayes (1999) reported that attachment between infants and mothers was impeded by the unexpected appearance of the premature infant and that attachment may be delayed purposefully by the mother as a coping strategy to avoid added grief should the infant die. In a later study, the use of appropriate communication and an individualized approach to care were reported as facilitators to attachment (Cox & Bialoskurski, 2001). Findings from a systematic review revealed that parents with an infant in the NICU

encounter a range of emotions including anxiety, depression, loss of control, and varying degrees of inclusion and exclusion (Obediate, Bond, & Clark Callister, 2009).

Quantitative enquiries have suggested that parents adapt well to the environment but would benefit from increased attention. Carter, Mulder, Bartram and Darlow (2005) compared the psychosocial functioning of parents with an infant admitted to the NICU with parents of term infants not requiring a NICU admission. Increased levels of symptomatology were reported by both mothers and fathers with an infant in the NICU. It was suggested that although current practices are mostly effective in addressing parental concerns, a proportion of parents would benefit from increased support. Turan, Basbakkal and Ozbek (2008) undertook an educational program with a group of parents who had an infant in the NICU. Compared to parents with an infant in the NICU who did not have the educational program, mothers' stress scores were significantly lower in the intervention group. Although these studies provide some insights into the experiences of parents, less well understood are the lived experiences of fathers with an infant in the NICU (Kadivar & Mozafarinia, 2013; Koppel & Kaiser, 2001). The purpose of our meta-ethnographic study was to describe the experiences of fathers with preterm infants in the NICU from published qualitative studies. We focused on fathers of premature infants since the majority of NICU admissions are related to prematurity and often require lengthy stays (Craighead & Elswick, 2014).

In order to develop an understanding of the experiences of fathers in the NICU, undertaking a synthesis of existing qualitative reports was an appropriate approach. Furthermore, a meta-ethnographic approach to synthesis is considered particularly

beneficial in answering questions related to experiences of health care (Atkins et al., 2008).

Callout 1 about here

Method

Guided by the Centre for Reviews and Dissemination (CRD, 2009), we used systematic search and review methods to identify qualitative literature about fathers' experiences of the NICU environment. One key criterion was that the use of the word "environment" included elements and aspects of the NICU 'space' such as the interactions with caregivers and others, the NICU atmosphere, the NICU equipment, and other elements which our review team felt contributed to shaping and creating the NICU environment.

Search strategy

Between October 2013 and October 2014, four electronic databases were searched. Advanced searches of published work with date restrictions (1980 – 2012) were conducted within the databases of CINAHL Plus, Academic Search Premier, MEDLINE (via Ebsco host), and PsychINFO. Search terms used included 'father', 'preterm infant', 'neonatal unit' and related synonyms. Key journals and reference lists were also screened for relevant reports. Our team considered that the included studies should range over a 20 year period, covering 1993 – 2013. This was considered a period within which significant shifts in the restrictive policies on family visiting in the NICU occurred. Furthermore, we made a pragmatic decision to restrict the inclusion criteria from 1993 based on our understandings of Changing Childbirth, (Department of Health, 1993), and its perceived effect on the drive to recognize the value of, and include fathers in maternity care. As research is continually evolving, the search was repeated towards the end of the review process and two additional studies were

identified that met the inclusion criteria (Gallegos-Martinez, Reyes-Hernandez, & Scochi, 2013; Hugill, Letherby, Reid, & Lavender, 2013). We adhered to PRISMA (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009) to ensure quality and completeness in reporting this process (figure1).

Inclusion and Exclusion Criteria

Qualitative findings that explored fathers' experiences of the NICU environment as a primary study aim were included. Additionally, papers had to have content which identified a premature infant (one born before 37 completed weeks of gestation) and the NICU environment. Only those papers reporting findings in English were included, and non-English papers were excluded. Case studies, grey literature, literature reviews, conference papers, and meta-analyses were excluded.

The database searches resulted in 571 papers. Forty two additional papers were subsequently identified from screening the reference lists of full-text articles, giving a total of 613 papers. All titles and abstracts were reviewed and 6 duplicates were removed, leaving 607 abstracts to be screened. Publications were considered irrelevant for the following reasons; being non qualitative in design, focusing on fathers' experiences of NICU in non-premature infants, and not reporting specifically on fathers' experiences. A further 547 papers were excluded at this stage, leaving 60 potential papers. On further screening of the full papers, we rejected 36 because the data were not related to the environment, but more to the experience of an aspect of care such as kangaroo care; the data did not identify or separate mothers' experiences from fathers' experiences; or the data were on the

experiences of transfer to and discharge from the NICU. We considered the remaining 24 papers suitable for inclusion.

Quality Assessment

Whether quality assessment should be included in a meta-ethnography is disputed (Atkins et al., 2008). We acknowledged that applying strict quality criteria in the selection process could result in important studies being excluded. There appears to be a lack of universally agreed criteria for the quality assessment of qualitative research, alongside a lack of consensus on what makes a qualitative study 'good' (Toye et al., 2014). However, we considered that an essential part of presenting a meta-ethnography should involve giving the reader a sense of the methodological quality of the selected papers. We therefore decided to conduct a critique of the papers once selected – drawing upon the Critical Appraisal Skills Programme (CASP, 2001) quality assessment tool for qualitative research. Overall, we reached consensus that the studies appeared to be of a reasonable quality with some limitations.

Characteristics of Primary Studies

This meta-ethnography is based on 24 studies undertaken in 12 different countries between 2005 and 2013. It includes 211 fathers, with sample sizes between 2 and 31. All authors used interviews as a method of data collection. Either wholly or partly, all authors described and illustrated aspects of fathers' experiences of the NICU environment during hospitalization of their premature infant.

Data abstraction and preliminary synthesis

We were guided by the seven steps of meta-ethnography as identified by Noblit and Hare (1988). The work of Toye et al. (2014) and Atkins et al. (2008) facilitated our decision making, specifically, the selection of an index paper (Toye el al., 2014) and undertaking thematic analysis of our individual concepts (Atkins et al., 2008). Findings from the studies were synthesized according to the guidance and suggestions from these sources. Noblit and Hare (1988) outline their process in 7 steps, which we followed; getting started, deciding on what is relevant, reading the studies, determining how the studies are related, translating the studies into one another, synthesizing the translations, and expressing the synthesis. As ethnographers, Noblit and Hare (1988) were interested in working with metaphors, however according to Britten et al. (2002), the method of ethnography is applicable to studies that are not ethnographic, and concepts rather than metaphors can be used (Britten et al., 2002; Toye et al., 2014). As a research team we decided that the use of concepts, and the need to develop a conceptual understanding of fathers' experiences of the NICU environment was an effective and appropriate way to illuminate this aspect of healthcare.

Getting started

This process was undertaken by the research team (n = 4) individually. We began with an index or 'key' paper (Helth & Jardin, 2013), that served as a guide to identify particular findings and comparing them with other findings in the other papers.

Reading the studies, deciding what is relevant

Using the key paper as a guide to identify ideas and concepts in relation to the experience of fathers in the NICU environment, we agreed that it was relevant to extract

any and all raw data from the other studies that assisted us in the process of gaining a holistic understanding of the experience, rather than merely describing it. We read the studies to become familiar with them and began extracting concepts and themes. We chose to create and use our own data extraction form to facilitate this process.

Determining how the studies are related

We loaded the raw data from both the results and the discussion sections of the studies onto a grid to display the concepts and themes we found in the previous step across all the studies. We then compared the initial concepts and findings from the key paper with the data from the other 23 papers in order to get some sense of how the studies were conceptually related. We identified concepts within each paper that were or were not related to the concepts in the key paper and then brought our concepts together for discussion. Although our individual concepts were relatively comparable, we had a considerable number of concepts from our individual extraction of concepts process, and we consulted the literature on conducting meta-ethnographic synthesis and agreed to undertake a thematic analysis of our individual concepts (Atkins et al., 2008). Examples of some of the individually identified concepts were as follows; the unknown, uncertainty, life in suspense, fragility, loss of control, the uninvolved, and there were many more. Having subjected these concepts to a thematic analysis we were able to identify a number of conceptual categories within each paper (Atkins et al., 2008).

Translating the studies into one another

We arranged the papers chronologically (Atkins et al., 2008) and started comparing the conceptual categories from paper 1 with paper 2, and the synthesis of these 2 papers with paper 3, and the synthesis of papers 1, 2 and 3 with paper 4, and so on. Throughout this synthesis, we examined relevant issues related to each theme such as, issues related to the effects of the organization and political climate on the environment. We were aware of the emergence of sub categories during the process and attempted to account for these where possible in the 'Synthesizing translations' processes.

Synthesizing translations

We adopted a team approach to synthesizing conceptual categories into concepts. Guided by Noblit and Hare (1988), who suggested '3 ways of synthesizing translations', we interpreted our findings as a 'line of argument synthesis' (Toye et al., 2014), to make the whole into something more than the parts alone imply (Noblit and Hare, 1988). Once overall concepts became apparent, they were linked together in a line of argument that represents fathers' experiences of the NICU environment during hospitalization of their premature infant.

Expression of the synthesis/Findings

For the fathers in our sample (n = 232), their experiences of the NICU environment during hospitalization of their premature infant were complex, challenging, and anxiety provoking. The 5 key concepts that emerged from the data were identified as: proximity, parental autonomy, vulnerability, communication, and exclusion and isolation.

Proximity

Based on the narratives, we interpreted the closeness and degree of physical contact experienced by the fathers as proximity. Whilst this was reported as a positive experience by some fathers, other fathers felt that the lack of it contributed to their experiences in a negative way. Some barriers to proximity were cited including the perceived fragility of the infant and the associated equipment. Fathers also reported that proximity itself was an enabler in that experiencing it allowed them to feel that they were fulfilling their paternal role. To encapsulate these findings, we termed this concept 'a need for proximity'. The need for proximity was expressed in positive terms by those fathers who had experienced it in various degrees: "The first time I held him skin to skin, it was really like wow! It was really interesting, like a communion, like a really privileged contact" (Feeley, Sherrard, Waitzer, & Boisvert, 2013a, p.75).

Some fathers expressed a need for proximity by citing various barriers including the perceived fragility of the infant, and the equipment was seen by fathers as preventing the proximity that they wanted. Another barrier to proximity and closely associated with the perceived fragility of the infant and the equipment was the concern of causing some sort of damage: "...it was like, you rather not touch him 'cause you thought then I'll rip off this or that tube or something like that." (Lundqvist, Westas, & Hallstrom, 2007, p. 494). Proximity was also influenced by staff and some fathers felt that staff acted as facilitators: "...if they (the nurses) hadn't asked me to [touch the baby], I wouldn't have done it" (Feeley et al., 2013, p. 77).

Fathers also reported that proximity depended on the information they were given. A lack of information or confusion in the information they were given meant that they were

unsure as to what extent they could touch their infants. Equally, the importance of proximity in terms of promoting normality and expectations of fatherhood was cited by some of the fathers:

> Well I'm absolutely certain that if I hadn't held her, then I am convinced that I would have been further out on the sideline and just standing there, looking upon my wife and baby and I don't think that would be good for a father (Helth & Jarden, 2013, p. 118).

This discussion alludes to proximity being an important concept in promoting inclusion and fulfilment of the paternal role.

Parental autonomy

The concept of parental autonomy relates to fathers having a recognized right to care for, hold, and make decisions about their new born infant. For a number of fathers, the data suggested that the NICU environment rendered them unable to exercise those rights, as if being unable to exercise their parental autonomy was as a result of their own internal fears and hesitations about navigating their way around the equipment. Some asked permission to have physical contact, but silently so, almost as if the environment rendered them unable to ask: "We still weren't sure whether you were allowed to pick her up" (Swift & Scholten, 2009, p. 253). For others, this was a result of their interactions with caregivers: "sometimes the staff gave me the feeling that the infant was not ours, we just have her on loan" (Lindberg et al., 2007, p. 145). The data embodied a paradox of the right to exercise parental autonomy with the need to hand the care over to the NICU staff:

> I felt I had no control over him because of the care he was getting. I knew he was getting the proper care and stuff that I couldn't, so for him, so it's like okay, you guys are in control; you know what you're doing. I felt I didn't have to worry about anything (Arockiasamy, Holsti, & Albersheim, 2008, p. e217).

This concept illustrates that autonomy is influenced by various factors and that it is perceived by fathers as a significant element of all that fatherhood embodies.

Callout 2 about here

Vulnerability

Whilst not explicitly stating the experience of having an infant on the NICU left them feeling vulnerable, many fathers' experiences related to vulnerability. For some fathers this was in relation to their feelings and abilities to care for an obviously fragile infant; with feelings such as fear, helplessness and criticism all being described. The sense of vulnerability experienced by fathers appeared to stem from the unfamiliar situation and environment that they were faced with, and a fear, almost an annoyance, of being judged. Whilst some fathers reported these feelings with regard to their own abilities: "In the beginning I was afraid of touching him, but after the first time it became less scary; in fact after a couple of times it was quite okay" (Fegran et al., 2008, p. 813), others felt and perceived vulnerability with regard to how others cared for their infant: "I saw them trying to rescue my baby. I really did not want to watch but I also was afraid I would never have a

chance to see him [the baby] again." (Lee et al., 2009, p. 515). At times, fathers reported internal conflicts, whilst themselves feeling frightened, they did not want to be perceived as vulnerable or weak, but rather as the strong family member who was there to protect the family. Although many fathers reported excellent support from caregivers, some of their actions increased feelings of vulnerability and there was also an emphasis on how caregivers and other parents perceived the father and their interaction with their child. While we concentrated on care within the NICU environment some fathers reported that this sense of vulnerability diminished upon discharge from hospital, although consideration should be given to the fact that due to being discharged the infant's medical condition would be much improved.

Communication

The concept of communication emerged following the interpretation of the narratives that highlighted aspects of information, interpersonal skills, and peer support. Communication was highlighted as valuable by several fathers in terms of the effect it had on their inclusion in the care of their infant. Information was a prominent issue within this concept as the right amount of information given in an appropriate way influenced the experiences of fathers in the NICU. The lack of information resulted in several fathers reporting a negative experience and some felt that the issue was exclusive to them. Additionally, the accuracy, availability, and level of information that was communicated were reported in both negative and positive terms: "…I found that often we were told different things by different people and you don't really need to know the exact science behind it… just need to know in layman's terms" (Hollywood and Hollywood, 2011, p. 36).

Information-giving was not always adapted to accommodate the father's lifestyle: "The trouble is when you are working, driving 2 hours a day … you don't have a lot of time to read a pile of information" (Ichijima, Kirk, & Hornblow, 2011, p. 212). Many fathers acknowledged the busy environment of the NICU as having an effect on the amount of time staff were able to spend talking to them, but still expressed the need for some interaction however minimal. The communication and interpersonal skills of staff were highlighted by some fathers as influencing their experiences in the NICU. Poor communication between staff was also reported: "Sometimes we had to inform the staff about what had been decided…maybe they did not report to others what they had told us" (Blomqvist, Rubertsson, Kylberg, Joreskog, & Nyqvist, 2012, p. 1992). Although only featured in two of the included studies, the need to interact with other parents was deemed important for a number of fathers, and this observation was therefore considered conceptually relevant. We felt that the term 'peer support' was an appropriate label which best captured this observation within the communication theme: "…sometimes you want to talk to someone who's been there, who's experiencing the exact same thing…" (Smith, Steelfisher, Salhi, & Shen, 201, p. 349). Staff were identified as playing a key role not only in the amount and level of information that is conveyed, but in the manner in which it is done. This concept also suggested the need for mutual communication between fathers.

Exclusion and isolation

Many narratives revealed that fathers felt disregarded during conversations, with the needs of the mother often taking precedence. Some fathers longed for opportunities to be more involved with their children and experienced a sense of "being out on the sideline"

(Helth & Jarden, 2013, p. 118) and "not really part of it" (Leonard and Mayers, 2008, p. 22). We considered that this concept was best described as exclusion and isolation. Part of the feeling of exclusion appeared to stem from the predominantly female environment as illustrated by one father feeling like "a rooster in a hen yard!" (Lundqvist et al., 2007, p. 493). In addition, the manner in which the needs of fathers to be included was overshadowed by those of the mothers is exemplified in this narrative: "If the two of us were sitting there and someone came up to us, it would always start with: 'OK Mom, now it's time to change the nappy'. There was never really: 'Ok Dad, now it's your turn'" (Hollywood & Hollywood, 2011, p. 37). Even when the baby was critically ill the father's needs were overlooked: "I think when the nurse came to my wife and said 'kiss your baby you mightn't see him again', why didn't she say it to me, as well?" (Hollywood and Hollywood, 2011, p. 37). Such disregard may erode feelings of self-esteem rather than highlight the father's unique contribution to the care of his child. At times the exclusion appeared harsh, as described by a father who "felt 'yes', it's happening" (Leonard & Mayers, 2008, p. 24) when witnessing a father performing kangaroo care, only to find "what was so very disturbing was just at that point in time, the nurse said 'No, men are not allowed' and they had to ask him to go out" (Leonard & Mayers, 2008, p. 24). By contrast, on occasions when fathers were encouraged to participate, it was apparent that fathers valued the opportunity to be included. In the studies we reviewed, being seen as an 'equal' parent is an important aspect of inclusion. Fathers' experiences of exclusion can cause distress and add to feelings of isolation.

Discussion

Whilst we identified five distinct concepts, we also considered them to be mutually dependent. Proximity was influenced by factors associated with vulnerability and communication. Proximity was also associated with feelings of exclusion and isolation. Autonomy and feelings of exclusion and isolation were also considered to be closely linked, as feeling unable to care for and makes decisions regarding their infants were both caused by, and resulted in fathers feeling excluded and isolated. Effective communication can also be considered crucial in promoting inclusion and alleviating feelings associated with vulnerability. Our findings have resonance with previous research. Researchers have identified that attachment is influenced by factors related to proximity and communication (Cox & Bialoskurski, 2001; Moehn & Rossetti, 1996) and feelings of exclusion and isolation have formerly been reported (Obediate et al., 2009). The physical environment of the NICU has also been identified as affecting mothers' participation in their infants' care (Jamsa & Jamsa, 1998) as well as leading them to feel like outsiders in the care of their children. This also appeared to be true for fathers, given our finding that they cited the NICU equipment as a barrier to proximity and inclusion. In previous studies investigating parental experiences in the NICU, researchers have used a range of research designs and included both mothers and fathers. Our meta-ethnographic approach to explore the qualitative experiences of fathers in the NICU environment adds depth to previous quantitative enquiries and the recurrence of similar findings strengthens the implications for practice.

Callout 3 about here

Limitations

Our findings should be viewed in light of the limitations of the methods used in this meta-ethnography. Only those studies reported in English were included, and this may have excluded an important body of research. The studies originated from a variety of countries where the NICU environments may be different. Therefore, whilst comparison of selected studies through reciprocal translation may be useful for generating theory about the experiences of fathers, it should be recognized that some findings may be more resonant with particular cultures. For example, the challenges of juggling work and visiting the neonatal unit may not necessarily apply to all fathers in Sweden where paternity leave entitlement for fathers is equal to the entitlement of mothers (Swedish Institute, 2014). Similarly the paternal role and the way in which fatherhood is perceived may be diverse and not necessarily applicable to all settings. In some studies, researchers explored the experiences of parents and did not discriminate between mothers and fathers. Although it was possible to distinguish between the vast majority of the narratives, Smith et al. (2012) credited them to both 'mother' and 'father' meaning that findings could not be attributed to fathers alone.

Implications for practice

The intensive care required by premature infants can create an environment that provokes negative feelings for parents. However, this emphasizes the need for staff working in the NICU to acknowledge this and to understand the needs fathers have to play an active role in their infants' care. This may be facilitated by offering equal time and involvement to that afforded to mothers, and ensuring that methods of communication facilitate inclusion. Staff

in the NICU play a vital role in promoting opportunities for physical contact between fathers and their infants. Encouraging fathers to become more confident handling their babies in the NICU must become an important aspect of routine practice. Reassurance and education concerning the equipment in the NICU may overcome some of the anxieties expressed by fathers, thus facilitating such contact. The inability to receive first-hand information appears to be problematic for some fathers absent from the NICU during the day. We suggest that historical and ritualistic practices need to be reviewed with the emphasis on the family unit. The option of later ward rounds by medical staff should be explored allowing for the attendance of fathers. This would also enhance the inclusion of fathers in making decisions regarding the care of their infants. The amount and level of information provided should be delivered in an appropriate manner to ensure understanding, thus further fostering inclusion. Additionally, the promotion of fathers engaging with each other by way of informal support groups should be encouraged and facilitated to give fathers the opportunity to discuss their feelings and experiences with others in the same situation.

Implications for future research

The studies included within this review were from multiple countries. It would be interesting to study countries individually comparing practices and environments in order to determine if the same themes of parental autonomy, communication, vulnerability, isolation and exclusion are highlighted by fathers. It may be hypothesized that countries offering fathers enhanced paternity leave may not report the same experiences. Another area for research would be from the perspective of staff working in the NICU.

Understanding the motivation behind their practice alongside the experiences of fathers may offer some practical suggestions as to how fathers' needs can be met. By exploring these concepts change may be initiated leading to enhanced experiences for families within the neonatal intensive care unit.

Conclusion

Our synthesis highlighted the intense emotional responses of fathers of preterm infants, alongside the powerful forces of the NICU environment in terms of fathers' abilities to engage and interact with their newborn babies. Findings suggested that there is an increasing focus on the needs of parents during the period when their infants are hospitalized in the NICU. There is a growing interest in the needs of fathers in this context, alongside a strong political emphasis on the role of health professionals to use interactions with families as an opportunity to identify the emotional and physical needs of parents and infants (Davies & Ward, 2012). It is well documented that the quality and level of fathers' interactions with their infants is particularly pertinent to child behavioral development. NICU staff are ideally placed for facilitating positive paternal-infant relationships. Having the opportunity to connect with, to be close to, and to handle their own babies, in a safe, understanding and welcoming arena appeared to be fundamental in alleviating many of the fathers' anxieties in our study. Encouragement to connect with their infants can provide a crucial component of the journey to satisfying fatherhood (Diamond, 1998). Our analysis extends previous findings by demonstrating that validation of the importance of paternal involvement by health professionals is a crucial factor in helping to prevent disengaged and

remote interactions between fathers and their premature infants during hospitalization in the NICU.

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Table 1: Summary of included studies of father's experiences in the Neonatal Intensive Care Unit

	Author(s), date and country	Title of paper	Method of investigation	Sample size	Population	Recruitment strategy	Good quality?
1	Helth TD & Jarden M. (2013) **Denmark**	Fathers' experiences with the skin-to-skin method in NICU: Competent parenthood and redefined gender roles.	In depth semi structured interviews.	5 fathers.	Fathers of premature infants admitted to the NICU at Copenhagen University Hospital.	Purposeful sample. 8 fathers approached with 5 in final sample.	Yes but recruitment method not clearly explained.
2	Ichijima, E, Kirk R & Hornblow A. (2011) **Japan**	Parental Support in Neonatal Intensive Care Units: A Cross-Cultural Comparison between New Zealand and Japan.	Mixed methods: Qualitative component – structured parent interview.	30 mothers and 17 fathers.	Parents in 2 NICUs.	Parents of infants born at less than 34 weeks approached by researcher after 14 days of admission to the NICU.	Yes but method of recruitment unclear.
3	Fegran L, &	The parent nurse	Observation	6 mothers, 6	Both mother	All eligible parents	Yes, although

	Helseth S. (2009) **Norway**	relationship in the neonatal intensive care unit context – closeness and emotional involvement.	and in depth interviews.	fathers, 6 nurses.	and father of infants of 26-32 weeks gestation of below staying the same hospital from birth to discharge and one of their primary nurses	meeting the inclusion criteria were asked to participate, no details given about the process	method of recruitment is not clear.
4	Fegran L, Helseth S & Fagermoen MS. (2008) **Norway**	A comparison of mothers' and fathers' experiences of the attachment process in a neonatal intensive care unit.	Semi-structured interviews.	12 parents (6 mothers and 6 fathers).	A 13 bed NICU; A convenience sample of parents using specific inclusion criteria (infant of 32 wks or less gestation, mother and father, both parents agreeable to participate).	Parents who met inclusion criteria were asked to participate.	Yes.
5	Wigert H, Berg M &	Parental presence when their child is	Structured interviews.	36 mothers and 31 fathers.	Parents of infants in	The parents of newly admitted infants in the	Yes.

	Hellstrom A-L. (2010) **Sweden**	in neonatal intensive care.			hospitalised 2 separate NICU units.	NICU units were approached and asked to participate in the study over a 2 weeks period.	
6	Swift MC & Scholten I. (2009) **Australia**	Not feeding, not coming home: parental experiences of infant feeding difficulties and family relationships in a neonatal unit.	Retrospectiv e in-depth interviews.	9 parents (7 mothers and 2 fathers) whose children had feeding difficulties.	Parents of infants in a NICU.	Parents whose infants had been discharged from the unit 5 weeks to 5 months previously and were aged between 3 and 6 months at time of interview were contacted via mail and asked to participate.	Yes.
7	Leonard A & Mayers P. (2008) **South Africa**	Parents lived experience of providing kangaroo care to pre term infants.	In depth interviews	6 parents (four mothers, 2 fathers).	All parents actively involved in providing kangaroo care to their preterm infants.	No information provided about recruitment.	Yes although lack of information regarding recruitment strategy.
8	Pohlman S. (2005)	The primacy of work and fathering	Between 6 and 8	9 fathers.	Fathers from 3 hospitals of	No information provided about recruitment.	Yes although lack of

	United States	preterm infants: findings from an interpretive phenomenological study.	interviews over a 6 month period.		infants born less than 33 weeks gestation, at least 22 years of age, sharing a home with infant's mother, within a month after the infant's birth.		information regarding recruitment strategy.
9	Feeley N, Sherrard K, Waitzer E, Boisvert L & Zelkowitz P. (2012) **Canada**	Fathers' perceptions of the barriers and facilitators to their involvement with their newborn hospitalised in the neonatal intensive care unit.	Interviews.	18 fathers.	Fathers from 2 open space design NICUs in a major Canadian urban centre	Eligible fathers were approached by a member of the clinical staff to obtain their permission to give details to research staff to contact them about the study.	Yes.
10	Lindberg B, Axelsson, K & Ohrling K. (2007)	The birth of premature infants: Experiences from the fathers' perspective.	Narrative interviews.	8 fathers.	Fathers of infants born below 36 weeks gestational age cared for in NICU, and who	Participants were selected by the head nurse at the NICU, who contacted them by telephone, and briefed them about the study. Fathers who were	Yes.

	Sweden				were living with child's mother during the interviews.	interested to participate were sent information after which the first author contacted the fathers.	
11	Lindberg B, Axelsson & Ohrling K. (2008) **Sweden**	Adjusting to being a father to an infant born prematurely: experiences from Swedish fathers (further data set of study 10)	Narrative interviews.	8 fathers	Fathers of infants born below 36 weeks gestational age cared for in NICU, and who were living with child's mother during the interviews	As above	Yes.
12	Lundqvist P, Westas LH& Hallstrom I. (2007) **Sweden**	From distance toward proximity: Fathers' lived experience of caring for their preterm infants.	Open interviews.	13 fathers.	Fathers of preterm infants who spoke and understood Swedish.	A consecutive series of 14 fathers who were eligible, were invited to participate, 13 of whom agreed to participate.	Yes.
13	Lee T-Y, Lin H-R, Huang T-H, Hsu C-H & Bartlett	Assuring the integrity of the family: being the father of a very low	In-depth interviews.	12 fathers.	First-time fathers of infants weighing less than 1500g	Potential participants were approached, though not clear by whom, and given a written	Yes.

	R. (2009) **Taiwan**	birth weight infant.			at birth and hospitalised in a NICU, who could speak Mandarin or Taiwanese dialect.	explanation of the study while the infant was hospitalised. Interested fathers left a telephone number for further contact and the investigator called potential participants.	
14	Skene C, Franck L, Curtis P & Gerrish K. (2012) **UK**	Parental involvement in neonatal comfort care.	25 periods of observation and 24 semi structured interviews.	10 mothers and 8 fathers.	Families with parents over 16 years old with infants residing in NICU.	Those who were eligible were approached by the researcher and given written and verbal study information.	Yes.
15	Blomqvist Y, Rubertsson C, Kylberg E, Joreskog K & Nyqvist K. (2012)	Kangaroo Mother Care helps fathers of pre term infants gain confidence in the parental role.	Interviews.	7 fathers.	Fathers with an infant born at a gestational age of 28 to 33+6 weeks initially recruited whilst on the NICU unit	Eligible fathers initially recruited via interview and followed up by telephone.	Yes.

	Sweden				but subsequent interview conducted at home.		
16	Deeney K, Lohan M, Spence D & Parkes J. (2012) **UK**	Experiences of fathering a baby admitted to neonatal intensive care: A critical gender analysis.	Semi structured interviews.	21 fathers.	Fathers with infants admitted to the regional NICU.	Purposive sampling – Fathers of infants of all gestational ages who were deemed suitable were approached by senior clinical sisters in the Neonatal Intensive Care Unit	Yes although the aim of the study is slightly unclear.
17	Hollywood M & Hollywood E. (2011) **Ireland**	The lived experiences of fathers of a premature baby on a neonatal intensive care unit.	Interviews.	5 fathers.	Fathers with a premature baby born between 24 and 30 weeks gestation and residing on the NICU unit at the time of the interview.	Non probability purposive sampling – face to face recruitment, all suitable participants were approached on one occasion and given a letter of invitation to participate in the study	Yes.
18	Feeley N,	The Father at the	Multiple case	18 fathers.	Fathers whose	Eligible fathers were	Yes.

	Sherrard K, Waitzer E & Boisvert L. (2013) **Canada**	Bedside, Patterns of Involvement in the NICU.	study, interviews.		infants were hospitalized in two level III NICU's in a Canadian urban centre.	approached by a member of the clinical staff to obtain their permission to give details to research staff to contact them about the study.	
19	Arockiasamy V, Holsti L & Albersheim S. (2008) **Canada**	Father's experiences in the Neonatal Intensive Care Unit: A search for control.	Semi-structured interviews.	16 fathers.	Fathers whose infants had been admitted and stayed on a level III NICU for >30 days.	Purposive sampling – no further detail provided.	Yes.
20	Smith V, Steelfisher G, Salhi C & Shen L. (2012) **Israel**	Coping with the Neonatal Intensive Care Unit experience.	Semi-structured interviews.	24 families (4 narratives apparent from fathers and 2 attributable to fathers and mothers).	Current and graduate NICU parents over 18 years old.	Parents identified from NICU admission log and discussions with medical team. Potential participants given a letter and were contacted further if they expressed an interest in participating.	Yes although ethical approval not explicit.
21	Pepper D,	More than	Semi-	5 families.	Parents of	Parents recruited post	Yes.

	Rempel G, Austin W, Ceci C & Hendson L. (2012) **Canada**	information – a qualitative study of parents' perspectives on neonatal intensive care at the extremes of prematurity.	structured interviews.	Only three narratives attributed to fathers specifically.	infants born at 24-26 weeks in identified NICU.	NICU discharge at neonatal follow up clinic.	
22	Sweet L. & Mannix T. (2012) **Australia**	Identification of parental stressors in an Australian Neonatal Intensive Care Unit.	Mixed methods study using inventories and qualitative questioning.	40 participants (24 mothers and 16 fathers) although only three narratives attributed to fathers specifically.	Parents over 18 whose infants had been admitted to the NICU for at least 5 days.	Purposive – initially mothers approached by a researcher on a level II unit with study information. Following time to consider participation, consent was gained from agreeing parents.	Yes although a large part of the descriptions and findings are attributed to the quantitative arm of the study.
23	Gallegos-Martinez J, Reyes-Hernandez, J. &Scochi	The hospitalized preterm newborn: The significance of parents' participation in the	Semi-structured interviews	20 parents (9 of these were mothers, and we have assumed the	Parents of both sexes aged between 18 and 39 years of age, with a preterm	Parents who agreed to participate in the study were recruited, recruitment strategy not explained	Yes although lack of information regarding recruitment

	CGS. (2013) **Mexico**	Neonatal Unit		remainder were fathers)	child admitted to the neonatal unit, who agreed to participate in the study		strategy.
24	Hugill K, Letherby, G,Reid, T & Lavender T. (2013) **UK**	Experiences of fathers shortly after the birth of their preterm infants	Participant observation and in-depth interviews, and an ethnographic survey	10 fathers were interviewed	Fathers interviewed were aged 20-27 years with infants born at 27-35 weeks gestation (mean 30) and aged 3-15 (mean 9.5) days old at the time of interview.	Recruitment strategy not explained	Yes, although lack of information regarding recruitment strategy. Ethical approval is reported, yet the procedures e.g. for consent are not made explicit

Figure 1. PRISMA flow diagram. (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009)