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PhD Thesis

A lifeline connecting new parents with the hospital

Using Participatory Design to develop and test an app for parents being

discharged early postnatal

Research Unit of Nursing

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DEFINITIONS

Early postnatal discharge: within 72 hours of delivery – the official Danish definition (1). The definition used in this study, however, is discharge within 24 hours, in accordance with the policy of the Region of Southern Denmark.

Term infant: an infant born in the period between 37 and 42 weeks of gestation.

Postnatal: refers, in this study, to the first seven days after delivery.

Telemedicine: 'The delivery of health-care services, where distance is a critical factor, by health-care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health-care providers, all in the interest of advancing the health of individuals and their communities' (2).

New parents/families: Depending on the context, I use either *parents* or *families* to refer to the mother and her partner. I sometimes add '*new'* in front of 'parents' to underline that they have a new baby – although this does not necessarily imply that it is the mother's first child. The study includes both primiparous and multiparous mothers and their partners.

ABBREVIATIONS

PPSS: Parents' postnatal sense of security
PSE: Parental self-efficacy
WHO: World Health Organization
App: application

LIST OF TABLES AND FIGURES

ORIGINAL PAPERS

Paper I

Danbjorg DB, Wagner L, Clemensen J. Do families after early postnatal discharge need new ways to communicate with the hospital? A feasibility study. *Midwifery*. 2014;30 (6):725-32.

Paper II

Danbjorg DB, Wagner L, Clemensen J. Designing, developing and testing an app for parents being discharged early postnatal. Volume 10. Issue 10.November/December 2014. *Journal for Nurse Practitioners*.

Paper III

Danbjorg DB, Wagner L, Kristensen, BR, Clemensen J. Intervention among new parents followed up by an interview study exploring their experiences of telemedicine after early postnatal discharge *Midwifery*. Accepted February 16th 2015. In press.

Paper IV

Danbjorg DB, Wagner L, Kristensen, BR, Clemensen J. Nurses' experience of using an application to support new parents who are discharged early postnatal - an intervention study. *International Journal of Telemedicine and Application*. vol. 2015, Article ID 851803, 10 pages, 2015. doi:10.1155/2015/851803.

Paper V

Nielsson, I. Danbjorg, DB, Aagaard, H, Clemensen, J, Larsen. KS, Kronborg, H. Parents' Experiences of Early Postnatal Discharge - a Meta-synthesis. *Midwifery*. Under Review.

INTRODUCTION

Since the 1990s, the average length of postnatal hospital stays has declined, both in Denmark and internationally. The most obvious reasons are a renewed focus on the fact that giving birth is not a disease, and the general requirement for cost savings in the healthcare system (3-5). In Denmark, the average length of postnatal hospitalisation has decreased from 92 hours in 2007 to 77 hours in 2012 (5).

A new policy was issued in the Region of Southern Denmark in 2011 (6) in which early postnatal discharge (i.e. discharge within max. 24 hours) was to become general practice following uncomplicated delivery for primiparous and multiparous mothers. The intention of the policy was that new parents would be at home during the postnatal period, but that they could visit the outpatient clinic for check-ups, and they would have access to telephone consultations around the clock. The healthcare professionals felt that the new policy did not meet their standards of ensuring new parents' sense of security and wellbeing, and parental self-efficacy.

This presented a challenge to find new ways to provide support for the early discharged mother, the father/her partner and the newborn child (1, 7).

In this thesis, the aim was to explore new ways to provide support for the early discharged mother and her partner, by investigating their needs, designing and developing a solution and exploring how they experienced it, and whether a telemedicine solution could ensure a sense of security, wellbeing and self-efficacy.

BACKGROUND

Early postnatal discharge

There has been considerable controversy regarding the consequences of early discharge from hospital after birth (3). Sceptics point out potential negative consequences, such as delays in detecting and treating maternal and infant morbidity, breastfeeding problems leading to early weaning, decreased maternal confidence, higher prevalence of maternal depression and increase in readmissions of mother and infant (8, 9).

In Denmark, readmission rates have increased in correlation with the decrease in length of the postnatal hospital stays. The readmission rate rose by 23% from 2011 to 2012 (5).

On the other hand, proponents of early postnatal discharge argue that it is a move away from medicalization of maternity care towards a more family-centred approach. From this perspective, early discharge has potential advantages, including the opportunity for all family members to be together and become familiar with the new baby, thereby improving bonding, reducing exposure to

nosocomial infections and enhancing parental confidence in their care of the newborn in the home environment (3, 8).

Parents' experiences of early postnatal discharge

However, an increasing number of qualitative studies exploring parents' experiences of early discharge from hospital after birth show their need for support and information within the limited period during hospitalization and the first few weeks at home (7, 10-12). It is revealed that they experience a lack of support, have many doubts and feel insecure (7, 8, 13-16).

The Danish National Study of Patients' Experiences (LUP) in 2013 showed that a third of the mothers experienced doubts in relation to breastfeeding after being discharged (17). Another Danish questionnaire study (N = 1,507 women) identified that 44.3% of the women who were discharged early (within 24 hours) from postnatal care experienced a lack of follow-up support, i.e. they felt that did not receive the support needed to care for the newborn; 37.5% did not receive support for postnatal self-care, and 46.1% did not receive adequate support around breastfeeding (18). These findings concur with other results in international research (4, 7, 19).

Parents' postnatal sense of security

A sense of security is an important factor, because it can influence a parent's journey towards becoming a parent. The Region of Southern Denmark's postnatal care policy underlines that, if the mother feels insecure, she is permitted to remain in the hospital longer than the defined 24 hours (6).

On the basis of a qualitative study of parents' experiences of early discharge from hospital after birth, Persson and Dykes developed the concept of 'parents' postnatal sense of security' PPSS. They identified the following as important elements in both parents' sense of security: Empowerment from staff, affinity within the family and the health and wellbeing of the family, and an empowering organisation as fundamental for strengthening these traits (11).

The healthcare professionals' empowering support is an important factor and includes encouragement, and a positive, enabling and supportive attitude. For the mother, it is important that the father/partner can participate, both during the pregnancy and during the childbirth process. Being met with a flexible attitude, where the healthcare professional take the parents' individual situation into account, and where they are able to decide for themselves and take responsibility for their own situation, gives them an experience of autonomy and control. Adequate, relevant and consistent information and practical advice, as well as being prepared for the time after birth, are essential.

For both parents, the father's participation is fundamental. This applies during pregnancy, during childbirth, and at home. Fathers want to be able to have contact with the baby from the very start and also to share the responsibilities, the practical support needs at home and to take care of the other children. It is also important for the mother to have the father/partner close at hand. This gives a feeling of affinity within the family (20).

An overall feeling of wellbeing for both parents depends on whether the baby is healthy; that the breastfeeding is functioning well, and that the mother is recovering. The parents consider it to be fundamental that they can ask questions, whenever questions arise, and to get help, if necessary. Access to help 24 hours a day is crucial. Together with availability and knowing where to turn for help, a planned follow-up is significant for the parents' sense of security (20).

The concept of PPSS originated with Segesten's sense of security (21), which relates to the Old Norse concept of 'tryghed'. The closest translation in English is 'a sense of security' (20, 22). A sense of security is a complex phenomenon that is based on both a basic sense of security and a situation-related sense of security. We all need a basic sense of security, which is founded in childhood, where the relation between mother and child is decisive. It is reflected in attachment theory, defined by Bowlby, where the first bonds formed by children with their caregivers have an impact that continues throughout life (23). A basic sense of security, together with the situation-related sense of security combine as an individual's overall feeling of security.

An individual's experience of security can be affected by various factors, for instance, giving birth, going to the hospital, being ill, etc. These situations can be perceived as causing disturbance, because they involve a threat of loss; for instance, loss of life quality, control over your life, etc. (21).

Parental Self-efficacy

Feelings of insecurity can have a negative impact on parental self-efficacy (PSE). The 1960s saw a new trend in cognitive and social learning theories. One of the first to start the new trend was psychologist Albert Bandura. His theories originated in behaviourism, but took a more humanistic approach, with a focus on the social, biological and cognitive aspects of learning. Bandura's social learning theory involves the concept of self-efficacy. Bandura states that self-efficacy beliefs influence the way that people think, feel and act (24).

Self-efficacy refers to the belief in one's ability to successfully perform a particular behaviour (25). For parents to positively engage parenting behaviour, they must have confidence in performing the specific behaviour. Parents with high self-efficacy are likely to make a greater effort than parents with low self-efficacy. According to Bandura, perceived parenting efficacy plays a key role in adapting to parenthood. Mothers who had a solid belief in their care-giving competences (before the

birth of their first child) experienced more emotional wellbeing and closer attachment to their baby as well as better adjustment to the parenting role during the postnatal period (24). Bandura also view 'becoming a parent' as a transition that thrusts adults into the expanded roles of both parent and spouse. The transformation from a marital dyad to a family triad increases the scope and diversity of coping demands. Bandura emphasizes that it can be a trying period for those who are ill prepared to take on the parenting role because of an insecure sense of personal efficacy to manage the expanded family demands.

The definition of PSE used in this study is: *'beliefs or judgments a parent holds of their capabilities to organize and execute a set of tasks related to parenting a child'* (26).

Self-efficacy beliefs are built either through one's own experiences (mastery experiences), other experiences (vicarious experiences), support from people in one's environment (verbal persuasion) or through emotional experiences (physiological and affective state of mind) (24, 25).

According to Bandura, parental self-efficacy beliefs should incorporate the level of specific knowledge pertaining to the actions involved in caring for the infant and the degree of confidence in one's ability to carry out the specific activities (27). Previous experiences, both positive and negative, as well as a lack of experiences, impact upon parents' perceptions of efficacy. Psychosocial mood also has an influence on parenting experiences. A positive attitude towards parenthood during pregnancy, a good experience of childbirth, and a positive state of mind on hospital discharge can also positively affect parenting experiences (28, 29). Vicarious experiences, as well as social and verbal persuasion, from family, peers and nursing professionals, contribute to parenting self-efficacy.

New ways to facilitate postnatal care

The new trend towards shorter hospital stays has also had an impact on the practice of healthcare professionals. They feel they have too little time to adequately support new parents, and to give individualised and timely information (30). WHO recommends that the healthcare system should observe the mother's and infant's condition, support the establishment of breastfeeding or other nutritional methods, monitor the growth of the infant and empower and support the parents to take care of their infant in the first postnatal days and weeks (31). In accordance with WHO, the Danish Health and Medicines Authority (1) states that new parents need a postnatal follow-up, and that this will guarantee that the observation and support of mother and baby that took place during admission are maintained and ensured following early discharge (1).

This situation presents a challenge to find new ways of offering support after early discharge. One possibility could be the use of telemedicine, which can provide an innovative solution and which has the potential to address some of the challenges faced in providing accessible and high quality healthcare services (32, 33). Telemedicine can be regarded as an umbrella term for any health service involving the use of health technologies involving the element of distance (34).

It is emphasised that telemedicine holds great potential for the delivery of healthcare services, by enhancing access, quality, efficiency and cost-effectiveness. It is predicted that telemedicine will continue in the relocation of healthcare delivery from the hospital or clinic into the home (35). Yet, it is also emphasized that policy makers should be cautious about recommending increased use of, and investment in, unevaluated technologies (36). It is stated that research within telemedicine has been inadequate (37, 38) and there is a need for investigations into the newer telemedicine solutions for well-defined patient groups (39).

Telemedicine has also been developed within obstetrics practice (40-44). Telemedicine technologies are shaping the ways in which prenatal care, delivery and postnatal care are delivered in the digital age. It has potential in the area of access to healthcare and could be an effective complement to traditional methods. It has been shown that telemedicine has the potential to provide appropriate support to early-discharged mothers and their families, because it offers the possibility for new parents to be guided by healthcare professionals in their transition into parenthood. Findings by Lindberg (42, 43) show that telemedicine has the potential to provide appropriate support because it presents new ways to communicate that can substitute for face-to-face contact. Healthcare professionals at the postnatal ward, Odense University Hospital, Svendborg, Denmark wanted to explore this potential.

AIM

The aim is to find new ways to provide support for the early discharged mother and her partner by investigating their needs, designing and developing a solution, exploring how they experience it and evaluating whether a telemedicine solution can ensure a sense of security, wellbeing and self-efficacy.

Phase one: Identification of needs

The aim is to identify the needs of new parents and their infants during the first seven days after delivery, based on parents' and nurses' experiences of early postnatal discharge.

Phase two: Design, development and testing

The aim is to design and develop a telemedicine intervention and to test whether it could be a viable solution for new postnatal families discharged early from hospital.

Phase three: Intervention and test

1. The aim is to explore how postnatal parents experience the use of a telemedicine solution, when they are being discharged early from the hospital, i.e. within 24 hours of childbirth, by investigating if they consider that their postnatal needs are met and whether they experience a sense of security and parental self-efficacy.

2. The aim is to explore how using an app in nursing practice impacts on nurses' ability to offer support and information to postnatal mothers who are discharged early and their families, in a way that will enhance the families' sense of security and self-efficacy.

METHODOLOGICAL FRAMEWORK

The chosen research design is Participatory Design (PD) with the purpose of involving the participants in designing a technology for postnatal care in order to create a solution that could meet the challenges of current postnatal care practice.

PD is located within an interpretative and critical worldview (45). Specifically for our study, it is inspired from hermeneutics philosophy, where the perspective has been to understand the participants' lived experiences in order to develop a technology to meet their needs.

We have used PD with a combination of qualitative methods, i.e. fieldwork, user activities and intervention. PD has its origins in action research (45-47).

Action Research

Action research is research method that explicitly points to changes in the investigated field. The common characteristic of the different orientations of action researchers is the collaborative relation between the researcher and participants in practice, where research is done together *with* the participants (48). Action research goes back 70 years in the history of research and it has its origins within social science. Psychologist Kurt Lewin (1890 – 1947) was one of the first to coin the term action research:

'The research needed for social practice can best be characterized as research for social management or social engineering. It is a type of action research, a comparative research on the conditions and effects of various forms of social action, and research leading to social action' (49).

Lewin developed the field theory, which was a contribution to an understanding of people in a group as independent, thinking and acting participants. It puts emphasis on the context and the inter-group relations and highlights that behaviour depends on the present field rather than on the past or the future. He claimed that the investigation of an organization and its possibility for change was thus closely related to the participants and their perception of the work and organization (50). Lewin focused on solving practical problems together with the people who experienced the problems and he believed that research could be democratic, as opposed to conducting 'cynical' experiments on people (50, 51).

This was the inception of what is known today as action research – a methodology that changed the relationship between the researcher and the participants by making the participants co-researchers. Since the early definition of action research, the term has evolved in a number of different orientations, one of which is PD (52). Action research and PD have also found their way into healthcare, where practitioners have used the methodologies to better understand and improve their practice. They have had a profound impact on healthcare development, for instance in the field of elderly care in Denmark (53). With the growing interest in telemedicine, PD has been used in the development of technological solutions, such as a project involving patients with diabetic foot ulcers, which resulted in the home treatment of ulcers that is now being implemented nationally in Denmark (54, 55).

Participatory Design

PD is a methodology that increases and highlights the participation of users in the design process of future technological solutions as a leverage for organisational change (54). It originated in the 1970s, where researchers from Scandinavia conducted action research with workers who wanted to analyse the effects of the introduction of IT at their workplaces. The results showed that the workers experienced to have little influence on their own working conditions (45). The researchers then engaged with the workers and their unions with the purpose of building up technical and organizational competence in order for the workers to gain/re-gain their democratic rights of codetermination on their working situation (52).

PD consists of participation and design. The term design is used in the same way as in architecture, with a focus on the analysis of needs and opportunities as well as the design of functionalities (56). Participation implies participation of the intended users, which is seen as one of the most important preconditions for good design; people are recognized as active participants in the shaping of the world around them. They therefore take active part in the exploration of needs and possibilities, and in the design and prototyping as well as the organizational implementation (57). Participation also

takes account of the researcher, who participates in the reality of the participants and endeavours to understand their practice (57).

As emphasised above, the primary intention of PD was to strengthen codetermination for workers. Participation can, thus, be viewed as both political and epistemological.

There has recently been a tendency for many PD projects to focus primarily on the epistemological argument for participation. The epistemological position of PD is that the type of knowledge needed for designing new IT solutions is developed through active cooperation between the intended users and designers.

'We further argue that it is by iterating between abstractions and concrete experiences that designers and users are able to develop the necessary knowledge needed for design' (58).

This way of regarding understanding is inspired by the hermeneutic circle, where *'all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form'* (59).

The hermeneutic circle (see Figure 1) characterises the interaction between parts and whole. It is this correlation that creates meaning, and that enables interpretation (60). It is not only the researcher who gains new understanding but also the participants, because they are a part of the interactive process and thereby also increase their understanding. The process of understanding is a 'joint venture' – it is not just a dialogical process, but also a practice orientated dialogue (51), where changes occur in both the practice and the participants.

Our project originated because we wanted to see if we could take advantage of new technologies in order to create a solution to meet a challenge related to the new practice of early discharge.

At first, we were inspired by telemedicine video consultations (54, 61, 62) but we wanted to involve users in designing a solution. We believed that good design depends on user involvement, but we also wanted to give them the opportunity to contribute to the shaping of their future practice. Healthcare professionals had experienced that the new policy of early discharge was decided *despite* their objections. The argument for participation has been both political and epistemological.

My perspective

I subscribe to the idea that good design must start from the users' practice, which is why I wanted to explore the participants' perspectives on their experiences i.e. in relation to my research topic, and to interpret their opinions (63). The phenomenologist believes that lived experiences give meaning to each person's perception of a particular phenomenon. For this reason, the phenomenologist explores subjective phenomena in the belief that critical truths about reality are grounded in

people's lived experiences. The starting and focal point of the study has been to describe the participants' lived experiences and the insight that comes with them in relation to the research topic. In order to do that and, furthermore, to explore the participants' experiences of the designed solution, I had to gain insight into the participants' lived experiences. I therefore drew on some of the ideas in phenomenology, by endeavouring to place my own preconceptions 'in parentheses' and thereby approach the phenomenon in an open-minded way. In this study, it is important to give an accurate description of how the participants experience and understand their early discharge (phase 1) and, later, the use of an app (phases 2 & 3). Therefore, I applied systematic text condensation (STC) in analysing the data (63-67). I will return to this in a later section.

A crucial point is that, in working with PD, my intention was not only to explore, but also to jointly design a technological solution with the participants. The knowledge necessary for the design was developed in collaboration between the researcher and the participants. This is reflected in the action research spiral (plan-act-observe-reflect) that guided the processes in this PD project. I will give an example from the first phase of the project. We had a preconception that the new postnatal policy of early discharge was experienced as a challenge by parents and healthcare professionals. This knowledge was used in the planning and conducting of actions; fieldwork was conducted to get an understanding of how new parents and healthcare professionals experienced the actual implementation of the early postnatal policy. The preconception was actively employed to choose the methods to apply to the phenomenon and to formulate questions for the interview guide. The fieldwork was an attempt to understand how early postnatal discharge played out in the empirical field. The observations were interpreted and formed a foundation for a new understanding. This brought us to the next phase in the study – how to approach the design phase. The planning of the next phase built on the new understanding gained in the first phase.

Participartory Design from a hermeneutic perspective
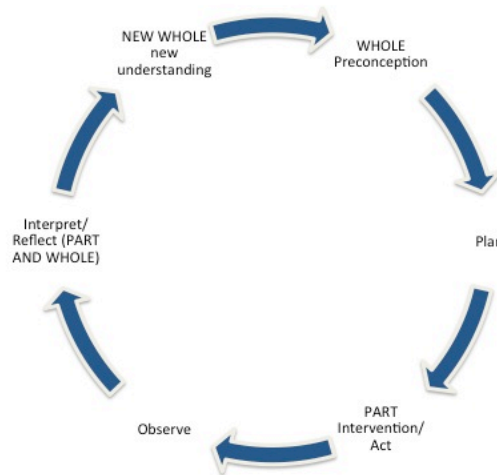
Figure 1(inspired by Majgaard (68))

Phenomenology and hermeneutics share several similarities, but there are also differences between them. The most important aspect of the hermeneutic approach in this study concerns the role of the researcher, who is actively involved as an active element of the research process in designing and developing a telemedicine solution. This is in contrast to the phenomenological approach, where the researcher is distant and sets aside her preconceptions (51, 69, 70).

Therefore, I explicate my preconceptions as factors inherent to my perspective. They were employed actively in the articulation of the research aims, provided inspiration for the interview guides and were also applied in dialogues/discussions about the results. I have approached the field with openness to the opinions of the participants and their experiences, as prescribed by Gadamer (71), with a recognition and acceptance of the fact that I cannot forget or set aside my preconceptions. My preconceptions are grounded in nursing and nursing theory, and have been developed by working in clinical practice and by studying nursing at university level. My view of postnatal care is in agreement with WHO recommendations and shaped by nurses' descriptions of the visions for postnatal care that are based on experience as well as evidence-based knowledge.

METHODS AND USER ACTIVITIES

The process in a PD project moves in iterative cycles (see Figure 2), where the actions are ongoing and parallel throughout the research process (Figure 3).
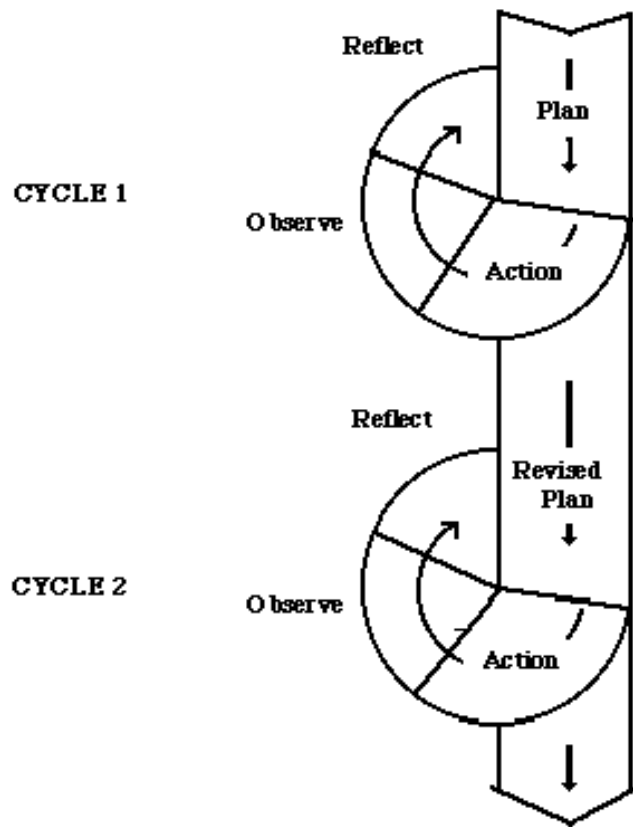
Figure 2. The iterative cycles of AR and PD. After Kemmis and McTaggart (72).
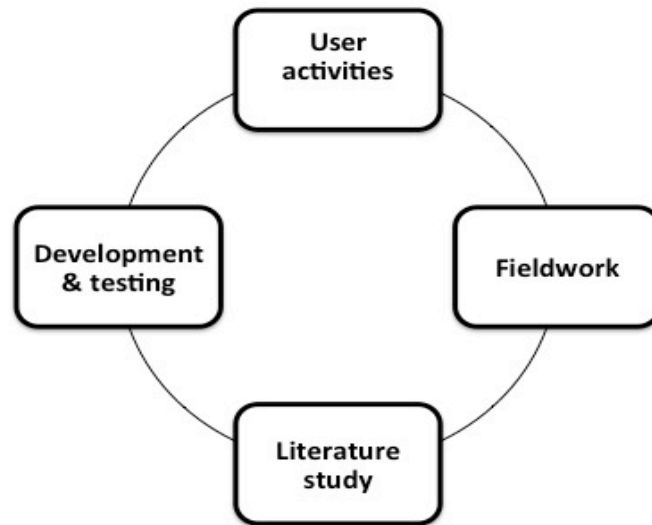
Figure 3: The ongoing and parallel actions in a PD process. Inspired by Clemensen (54).

The process has been divided into three phases, where each phase was planned by reflecting on the results from the previous phase (Figure 4).

In PD, various methods and user activities are employed to reflect the aim of the study as well as the different phases in the project. Some of the actions can be *fieldwork*, such as participant observation and interviews, for instance when identifying the needs of the participants. *User activities* can be, e.g., creative workshops, conducted to generate ideas for possible solutions. *Development and testing* follows the design process, where the ideas are realised in the actual development of a technology. *Literature studies* are continuously conducted as part of the process of understanding. The various methods and user activities employed in our study are elaborated in the following, and their practical application will be explained when reporting on the actual study.

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PHASE 1: IDENTIFICATION OF NEEDS

Participant observation

Interviews

Focus Group interviews

OCTOBER 2011 – MAY 2012

        PHASE 2: DESIGN, DEVELOPMENT AND TESTING

                PHASE 3: INTERVENTION

        Creative workshop
                                Intervention
        Experimenting with
        prototypes              Participant observation

        Development             Interviews

        Pilot test              Focus Group interviews

        Participant observation
                                MAY 2013 – OCTOBER 2013
        Interviews

        MAY 2012 – FEBRUARY 2013
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Figure 4: Overview of the project. Phases and activities.

Fieldwork

Participant observation was conducted, because it can help to develop an understanding of how people organize their work. The purpose of the participant observation was, initially, to gain an insight into how the early discharge policy was implemented. Later in the project the objective was to gain insight into how the nurses experienced using the technology as part of postnatal care. Spradley emphasises that ethnography is about *learning from people* rather than *studying people*. While conducting the participant observation, I observed what happened in the situations and asked questions in relation to my research interest. As recommended by Spradley, I documented my observations as objectively as possible by writing field notes (73). I wrote field notes with a focus on place, participants, emotions and activity (74).

Interviews were conducted throughout all three phases. We chose to conduct interviews to gain insight into the interviewees' experiences of early discharge (phase 1) and the use of an app in relation to early discharge (phases 2 & 3) (63). An interview is an *inter-view*, an exchange of views between two people, and a suitable method to gain insight into the interviewees' life-world (63, 75). I conducted semi-structured interviews that were characterized by the use of the knowledge-

producing potential of the dialogue, which gives a greater freedom to act; for example, it offers the possibility of pursuing what the interviewee finds interesting (within the scope of the research topic) (76).

A relaxed atmosphere characterized the interviews conducted with the new parents – their newborn was with them and sometimes we had to pause interviews to allow for breastfeeding or changing nappies. The majority of the interviews were conducted at the parents' homes. A range of different kinds of interviews were held during the study: individual face-to-face interview, informal interview during the participant observation, telephone interview and focus group interview.

I prepared interview guides for the different interviews that were conducted (Appendix A). The interview guides were inspired by my preconceptions, the literature and relevant theories and concepts, and reflected the themes I wanted to cover. I will elaborate on this later, when I give the details of the specific interviews.

The interview guides were composed as a sketch of the different themes to be covered and suggestions for specific questions. They were inspired by Kvale, who lists eight relevant types of question that one can use throughout the interview: opening, follow-up, enquiring, specific, direct, and indirect, structural and interpretative questions. He also emphasizes the use of silence (63). Depending on the specific interview, I either followed the interview guide or just used it as a checklist to ensure that I had covered the themes.

As part of the design, developing and testing phase, we chose to conduct telephone interviews, because of the time pressure involved. We considered the criteria recommended by Shuy, when deciding between telephone and in-person interviewing, e.g., the type of interview, the type of information sought, age of the participants, the need for contextual naturalness of setting, and the complexity of the questions (77).

In the intervention phase, the priority was to hold individual face-to-face interviews in order to get more rich and in-depth data. However, because of logistical challenges (due to the parents' new life situation with a new-born) involved in arranging interviews, we chose to conduct telephone interviews with some of the new parents, as it suited them better. This is despite the fact that, when comparing the in-person and telephone interview, Shuy underlines several advantages of being face-to-face (77), such as more precise responses, time to think thoroughly about responses and more self-generating answers (77). However, it was my experience that the telephone interviews generated interesting and varied data that matched the in-person interviews.

Focus group interviews were conducted in phases 1 and 3, because focus group discussions can mobilise associations, where the group dynamic contributes to the creation of narratives (78). This

was relevant when exploring the participants' experiences with both early discharge and the use of the app.

A focus group interview is appropriate when a researcher wants to explore people's experiences and understanding of a phenomenon. It is less suitable when one wants to produce data about the individual's life-world. This is why it is recommended to combine different methods, as we have done (78).

It is recommended that a focus group consists of six to twelve participants. There should be the right balance of homogeneity and variation, as this allows the group interaction to generate constructive associations and enable a dynamic that allows for discussion. This was taken into consideration when the groups were composed. For example, one group comprised only first-time parents.

There are different schools of thought about whether focus group participants should know each other beforehand (79). In this case, the healthcare professionals in the focus group interviews knew each other, because they worked together. The new parents did not know each other in advance (78).

The focus group interviews were conducted using open questions and some follow-up questions. This was in order to let the participants discuss freely, and allowed for the possibility of asking follow-up questions, if the areas of interest for the research had not already been covered (78, 80).

User activities

A workshop inspired by '*the creative platform'* was held. The creative platform is a 'mental' meeting place where participants from different professions and social and cultural backgrounds can meet and develop new thoughts and actions together in a creative process (81, 82). The essential element of a creative process using the creative platform is an idea. The process involves developing ideas on ideas on ideas, until a possible solution arises. The principles of the creative platform, i.e. parallel thinking, task focus and lack of judgment, were applied, which resulted in a process in which the participants were focused on developing ideas for optimum postnatal follow-up. The goal was to enable the participants to apply and share their knowledge in order to come up with new solutions for a postnatal follow-up (82).

During the creative platform, 3D cases were applied. 3D cases are short, stimulated experiences, such as picture associations. The objective in using a 3D case is to make a change in the participants' thinking, for instance with picture stimuli where the goal is to get new ideas by association (82, 83).

We experimented with prototypes to create experiences of the use of new IT interventions. Experiments with prototypes can consist of a range of activities: developing the prototype, testing the prototype, and evaluating the experiences. A prototype is a simple version of an envisioned IT system.

We experimented with demo versions of standard products, i.e. video consultations (phase 2), which generate experiences with different ways of organizing the use of a system, as well as how the IT meets the needs of the users. When the overall form of IT intervention is in place, experiments may involve more established and finished versions, so called vertical prototypes, which we incorporated at the end of phase 2, where we tested the developed app (46)

Before the actual development of the app, we wrote user stories. **A user story** is one or more sentences in the everyday language of the end user that captures what a user can do using the software (84). The user stories were made from the principle: As [somebody] I am able to do [something]. The scenarios in user stories help to visualise the specific application of a proposed IT solution, i.e. the users can imagine what the solution will be like. Scenarios are prose-style representations that exemplify the work practice in future use of the system. Scenarios can exemplify an application of the system as viewed from different users' perspectives.

The user stories were presented in a hearing. The idea was to give the users the opportunity to review and comment on a product in the design process, before any final decisions were made. As recommended (46) the hearing took place by exchanging information in writing and oral communication at meetings.

Development

We applied **scrum** as the framework for developing the software for the app. The term scrum was coined in 1986 and defined as *'a flexible, holistic product development strategy where a development team works as a unit to reach a common goal'* (85).

The software development consists of development periods, so called sprints. Each sprint lasts between seven and 30 days. It is launched with a planning meeting (sprint planning) and is completed with a demonstration of the new version of the software (sprint review).

ANALYSIS

For the data analysis, I found inspiration in Systematic Text Condensation (STC). Malterud developed the model for analysing qualitative data (66, 67).

The theoretical starting point for STC is inspired by Giorgi's phenomenological analysis (64, 65). It is important to stress that the phenomenological analysis, here the STC, can be applied within projects other than phenomenological projects (63). Malterud modified the method, which seems to

move away from descriptive phenomenology and place itself somewhat closer to hermeneutics. Malterud emphasizes that any description is coloured by interpretation (66). She also states that, by articulating the aim of the study, one is already guided by preconceptions.

The preconceptions and the theoretical framework shape the perspective taken in the analysis. The material is read in that light, and the 'answers' are organized and paraphrased systematically. STC implies an analytical reduction with stated shifts between decontextualization and reconceptualization of the data. In STC the researcher moves between identification with – *and* bracketing – a specific theoretical perspective during the different steps of the analysis process. I will present below our use of STC, including the practical procedures.

The data analysed in the study comprised: data from participant observation, interviews and focus group interviews in phase 1, data from the creative workshop, participant observation and interviews in phase 2, and data from the interviews, focus group interviews and participant observation in phase 3. See Table 1 for an example of one of the analyses conducted in the study. For an overview of the data material, see papers I-IV.

Step 1: From medley to themes: Superior themes extracted after the first open reading of the text.	Step 2: From themes to codes. Identifying the meaningful units. The meaningful units are coded based on the superior themes as well as the preconceptions and the theoretical frame.		Step 3: From codes to meaning. The meaningful units are sorted into groups with respect to the codes. Overall categories arise from the coding process, and divided into subcategories. We reviewed each meaning unit within the different subgroups and reduced the content into a condensate.
No tears	QUOTATIONS 'I answer their questions… (…). I look at the photo of the umbilicus for instance or what ever it is. But I do not have the mother's tears. It creates a distance'	[code] *[Lack of senses]* *[one sided dialoque]*	Telemedicine as a means of providing support Sub groups: *Adjustment to new ways of communicating* *Connecting hospital and home*
Open door	'And I think that it is a help. They feel that it is ok that they take contact'	*[help available]*	
Repetition	'Then they get the pop-up messages which means they get the		Telemedicine as a means for timely and accessible information.

| | information one more time, that's great' | *[timely information]* | Subgroups: *Accessible information* *Timely information* |
| A lot of information in a short time | 'You are just talking, talking, talking… And how much do they really remember?' | *[Too much information]* | *'There is a lot of information that we have to communicate in a short time. We are giving them way too much information; they cannot remember it when they come home. Sometimes they even fall asleep when you are giving them information. They need to get the information in a different way. The automated messages are a suitable way'* (example of condensate). |

Table 1: Process of Analysis – examples from the analysis

The practical procedures of STC consist of four steps, which I will clarify in the following.

1. Total impression – from chaos to themes

First, I got an overview of the material by reading the transcripts to get an overall impression of the whole, looking for preliminary themes associated with experiences of early discharge (67). The themes represent a first, intuitive data-based step in the organization of the material, but also constitute the foundation for further analysis.

2. Identifying and sorting meaning units – from themes to codes

I systematically reviewed the transcript line by line to identify meaning units. A meaning unit is a text section that contains information about the research question. Then I coded the material. This included identifying and sorting meaning units potentially related to the themes previously identified in the first step of the analysis (67).

The coding classifies the meaning units, which are related to the preliminary themes. I used the themes as road signs to help locate text bits that are marked with a code. By doing so, the related text bits were collected. During coding, it is necessary to refine the original classification, because two or more of the themes deal with the same idea. This occurred several times during my coding. Malterud underlines that it is important to be flexible in the coding process, as it can occur that the preliminary themes from the first step were not accurate. This is an iterative and ongoing process. It helped me to grow my understanding of the data.

The coding was done in Microsoft Word, where each participant was assigned a number, and the meaning units were highlighted.

3. Condensation – from code to meaning

The third step of the analysis involves a systematic abstraction of meaning units within each of the code groups established during the second step of the analysis.

At this stage, data are reduced to a decontextualized selection of meaning units sorted as thematic code groups across individual participants. Data are organized and reduced to a few code groups containing meaning units that reveal aspects of the participants' experiences.

I worked through the code groups. Each code group contained nuances that described different aspects of the code. I sorted the material into subgroups that contained diverse statements about the code. The subgroups became the units of analysis. We reviewed each meaning unit within the different subgroups and reduced the content into a condensate, which can be compared to an artificial quotation. It is an artefact, comprising the content of the meaning units by transforming them into a more abstract format. The condensate is a working note, offering a point of departure for elaboration of results in the final step of the analysis (66, 67).

4. Synthesizing – from condensation to descriptions and concepts

We synthesised the content of the condensates by developing descriptions and providing stories that could elucidate the research question. The results are concentrated into the category heading of each code group (66, 67). The synthesis must be communicated so it is loyal to the participants' voices and the observations conducted, which is why the results are summarised close to the text and with several quotations.

Another element of the analysis was an assessment of the findings compared to existing research and theory – this can be found in the discussion of results.

THE STUDY

The study consisted of three phases; the identification of needs phase, the design, development and testing phase and the intervention phase, as shown in Figure 4.

A phase is a collection of activities that brings the project from one stage to the next. At each stage, progress was evaluated and we decided how to proceed to the next phase, which was a reflection of the results from the previous phase (46).

Each phase was an iterative process that moved in a spiral of planning-acting-observing-reflecting. I will describe each phase in detail in order to clarify how the processes led to a new understanding. The results are presented continuously and I will explicate how they were used in order to take the next steps. This will show the links between the phases.

The results are described in depth with quotations in papers I-V.

PHASE ONE

IDENTIFICATION OF NEEDS

This section reports on the identification of needs. We wanted to investigate whether telemedicine could be a possible solution for new parents discharged early from the hospital following childbirth. The aim of the first phase was therefore recognised as: *to identify the needs of new parents postnatally during the first seven days, based on parents' and nurses' experiences of early postnatal discharge.*

Literature search

To gain insight into the existing knowledge about the issue, a literature search was conducted prior to – and throughout – the study period, with a final search in December 2014. The literature search was undertaken from different perspectives (see Appendix B for literature searches). At first, I conducted a broad literature search on the topic of early discharge as well as early discharge and telemedicine. This early literature search was nowhere near a systematic literature search, but it was used to explore the research topic (Appendix B, literature search I and II). With the focus on the needs of the parents, it became relevant to focus solely on the qualitative studies of parents' experiences of early postnatal discharge.

A systematic literature search with a narrower focus solely on the qualitative aspects of parents' experiences of early postnatal discharge was conducted in January 2014. It became the foundation for a meta-ethnography (Paper V and Appendix B, literature search III for the search and selection process).

The anticipated problem was substantiated by the literature search in several ways. The literature search showed that there has been considerable controversy about the consequences of early discharge from hospital after birth (3). Sceptics point out potentially negative consequences, such as delays in detecting and treating maternal and infant morbidity, problems related to breastfeeding leading to early weaning, decreased maternal confidence, higher prevalence of maternal depression and increase in readmissions of mother and infant. Proponents of early postnatal discharge argue that it is a shift from medicalization of maternity care towards a more family-centred approach. These diverse views of early discharge were reflected in the debate that occurred prior to the decision to implement the new Danish postnatal discharge policy. The debate included discussion of the 2002 Cochrane review, where it was concluded that early discharge of healthy mothers and term infants apparently had no adverse effects on breastfeeding or rate of maternal depression (3). Even though there is no evidence to prove that early postnatal discharge has adverse effects, nevertheless there was a professional concern among healthcare professionals about the more qualitative aspects of early discharge, such as parental experiences. This concern was supported in

the literature, where qualitative studies on parents' experiences of early discharge from hospital after birth show that new parents who are discharged early experience a lack of support, have doubts and feel insecure (8, 13, 14). Parental experiences of early postnatal discharge were characterised by a wealth of different emotions, from anxiety and insecurity to calmness and affinity. The experiences focused on the parents' feelings on coming home from the hospital, how they came to realise that the baby was dependent on them, how they wanted to do the best for their baby but did not know how, how they managed the challenges or were caught in their feelings of incompetence and how they experienced getting help from health professionals. The results are presented in depth in paper V.

Data collection

I wanted to explore parental experiences locally on the obstetrics ward following implementation of the policy. Therefore, participant observation was conducted (37 hours) in October 2011. I observed ten families on their visits to the postnatal clinic; five visits with a midwife 48 hours following birth and five visits with a nurse on either day four or five. I spent time with the healthcare professionals talking about the families' postnatal needs. The purpose of the observations was to get a grasp of the problem in the local setting and to identify themes for the interview guide.

Secondly, I conducted individual interviews (n=7) with parents discharged from the postnatal ward with either one or both parents at home during the period from October to November 2011.

Thirdly, focus group interviews (n=3) were conducted, i.e. one focus group with the healthcare professionals (nurses, healthcare visitors, midwives, doctors) (n=12), one focus group with primiparous parents (n=5) and one focus group with multiparous parents (n=4) in March 2012. Semi-structured interview guides were compiled and included the themes that we wanted to address and suggestions for questions. The interview guides were used to keep the conversation on track. The interview guides focused on three main themes: (a) Participants' experiences of guidance and advice provided within the first week after birth; (b) Participants' perspectives on support options that would provide them with a sense of security, self-efficacy and wellbeing; and (c) Participants' experiences of early discharge (Appendix A, 1-3).

Concurrent with the data collection, I established the project group in January 2012. It consisted of five nurses, one doctor and two midwives. In the first phase (January to May 2012), the project group met three times and between the meetings were involved in email discussions. The project group assisted in planning the interviews as well as reflecting on the interviews conducted. During the phase, I also had informal meetings with the different staff members between the interviews, where they were informed about the purpose and details of the project.

Besides the project group, a researchers & programmers group was established, which consisted of two of my supervisors, the two computer programmers and me. The two computer programmers were from a private IT company, who we engaged to cooperate with designing and developing a telemedicine solution.

The group was involved in the planning of the activities in the phase, and one of the computer programmers and one of my supervisors also participated in the focus group interviews. This group was also involved in the analysis of the data from the interviews.

Results from phase one

Following the data analysis, three overall categories were identified:

The need for an individual follow-up

The need for availability

New ways to communicate

The need for an individual follow-up

The families experienced that early hospital discharge made them feel under pressure. Some were left with a feeling of being 'kicked out'. The pressure generated a feeling of insecurity. They felt like they did not have the time even to assess whether they were ready to go home.

The families experienced that early discharge undermined their individuality; they felt that everyone had to fit into the same box and that it lacked a more personal focus. Some of the families felt that their needs were 'special' and they questioned whether they could expect the healthcare system to show consideration for them.

A need for availability

It was clear throughout the analysis that the families, especially the primiparous parents, were dependent on their networks of family and friends. They expressed a sense of confidence about, and praised, family and friends who were accessible when, and if, they needed assistance. The healthcare professionals indicated a somewhat ambivalent attitude towards the families' use of their private networks.

On the one hand, they considered it valuable that families had someone to turn to, but on the other hand it was a challenge for the healthcare professionals not to appear condescending when informing new parents that some of the advice they had received from people in their network may be incorrect or not evidence-based. The professionals emphasised that there could be a contradiction, for instance, between the advice given to families by people in their networks and, for instance, new guidelines on breastfeeding, sudden infant death syndrome, etc.

The parents were explicit that they wanted to have a healthcare professional nearby, as this would give them a sense of security. It was just as important for the new parents to be able to seek guidance in the middle of the night, because newborns did not distinguish night from day and, as several of the families stated, they felt most vulnerable during the night.

The parents felt ambiguous about the opportunity to be at home and have the family together, because they also missed having a healthcare professional on hand. One mother enjoyed being at home during the day, but at night she had the urge to 'check in' at the hospital and have a professional answer her questions.

The parents experienced doubts and questions during the first postnatal week, which left them feeling insecure. Most concerns concerned breastfeeding and the wellbeing of the newborn. It was mainly the primiparous parents who had questions regarding care of the infant, but some of the multiparous parents also felt insecure. One multiparous mother was slightly panic-stricken because she felt that she did not remember anything about infant care. She had two older children but felt insecure even concerning basic care tasks for the newborn.

New ways to communicate

Both the healthcare professionals and the families expressed that the families felt that they were averted when they tried to contact a healthcare professional after discharge. Their experiences of phoning the postnatal ward and their family doctor left them with the impression that it was difficult to get through. The families expressed a clear understanding of the business pressures in the healthcare system and felt stressed that they might be disturbing the health professionals unnecessarily if they tried to contact them. The professionals confirmed this difficulty when meeting with the families at the outpatient clinic, where questions that should have been raised earlier were finally asked.

The option to chat online with healthcare professionals was mentioned as an alternative to phone calls. The new parents stated that it would be easier and more convenient and that sending a chat message would be less disruptive.

The healthcare professionals reported that, since the policy change in favour of early postnatal discharge came into effect, they had to start to prepare women as early as during their pregnancy to cope with the postnatal period following early discharge. This meant that families were provided with a great deal of general information.

The challenge appeared to be to provide families with individualised information at the right time. The families also informed us that they had received a substantial amount of written information from the hospital to which they could not relate. They would like the information to be 'tailored' and easy to access. They found it easier to Google terms than to read through a pile of pamphlets.

The parents turned to the Internet for help, using the Google search engine. They also accessed various baby-related websites and used baby-related applications downloaded onto their smart phones or tablets. The parents explained that they were ambiguous about using these sources because they found a lot of useless information and they were concerned about the validity of the information they found.

Summatively, the results of the first phase gave us a new understanding of the needs and also suggestions for a possible telemedicine solution. In brief, new families requested an individualised postnatal follow-up, timely information and guidance and accessibility to, and new ways to communicate with healthcare professionals. Even though we tried to focus solely on their needs, when telling us about the challenges they faced in early discharge, the participants spontaneously suggested solutions. In this way, they indicated that it could be possible to meet their needs after early discharge if new ways to communicate were made available, such as online communication and evidence-based information knowledge bases.
This led to the next phase.

PHASE TWO

DESIGN, DEVELOPMENT AND TESTING

The aim of this phase was to design, develop and test if telemedicine could be a viable solution for new postnatal families discharged early from hospital.
The activities in this phase can be divided into three stages. First, we concentrated on the design. Then the app was developed and tested in a pilot test.

Data collection

A two-hour workshop (81) was held in May 2012. The participants from the focus groups were asked if they would like to participate in the workshop. Those who could attended and some also brought colleagues.
In total, five nurses, one healthcare visitor, three doctors, two midwives, two multiparous mothers and two primiparous mothers attended.
The identified needs of the parents (phase 1) were presented to trigger and develop ideas for new solutions. The participants knew that the aim of the study was to design and test whether telemedicine could be a solution. The participants were asked to come forward with all their ideas in order to have an open process, which could hopefully make them think creatively when they were not restricted in the idea generating process.

Partial results from the workshop

The results of the workshop reflected the needs of the new parents, since they had requested more access to the healthcare system. They had experienced a barrier in attempting to contact healthcare professionals after discharge, and they had asked for new ways to communicate, such as the use of e-mail and texting that would eliminate that barrier and meet their needs for more individualized and timely information and guidance. They came up with ideas for different kind of solutions, and we chose to focus on the technological solutions. They suggested specific technological solutions, among which ideas were service text messages on a daily basis after discharge. The messages should contain the advice that the healthcare professionals would have given in person, had the new parents remained in hospital.

One idea was for an online hotline via Skype. It would allow parents to contact the healthcare professionals and reduce the need to go for a check-up.

The possibility of contacting the staff via email or chat was also suggested. This would give easier access to the healthcare professionals and serve as an alternative to a phone call.

Other ideas focused on the possibility for having pamphlets digitalized, where the information material could be accessed from a website or an app, which should also include the possibility to search a knowledgebase, in the same way as one would search using a search engine.

Experimenting with prototypes

The researchers & programmers group met after the workshop to discuss the ideas. We decided to facilitate a two-hour workshop, where we could experiment with prototypes. The participants from the previous workshop were invited. Some could not attend, and another new participant took part. Two nurses, four midwives, two health visitors and four mothers participated.

We chose to try out Skype and Face time based on the results from the workshop. We tried out a video conversation on a stationery personal computer and on a mobile tablet device.

We wanted to try out different scenarios that would reflect the different postnatal follow-up options, so we 'played out' the 24 hour follow-up telephone consultation after discharge as a Skype meeting and a consultation at the hospital as a face time meeting At a face-to-face consultation, the nurse would weigh the baby; we tested how it would work if the mother did it instead.

Partial Results from the workshop

The results from the workshop were somewhat mixed.

The healthcare professionals experienced that the online method of communicating was difficult, whereas the mothers seemed more familiar with communicating by way of online media. The professionals felt alienated in having to communicate through Skype/face time and experienced that it was difficult to communicate delicate topics in a video consultation.

Another challenge was in handling both the baby and the equipment, i.e. the tablet and the scales at the same time. One of the situations that we played out was a consultation at the hospital via face time, where, instead of the nurse, the mother had to weigh the baby. We could see that it was difficult for the mother to handle both weighing the baby and at the same time operate the tablet.

Designing an app

After the workshop, a design workshop for the researchers & programmers group was held (June 2012). We listed the parents' identified needs along with the design ideas that had been conceived, the specific experiences gained from the technology workshop and knowledge about different technology solutions.

We sketched out the different ideas and discussed the connection between each of them to the identified needs, to clarify whether the design idea actually reflected the needs.

The result of the design workshop was a design proposal involving an app with a range of suggested functionalities in the form of six modules. Prose-style representations were written, i.e. user stories to be associated with the different proposed functionalities of the app. The user stories were generated from the principle: As [somebody] I am able to do [something]. Example one: '*As a new mother I am able to write a text in a message and I also have the possibility to attach a photo or recorded video directly or one chosen from the photo library'*. Example two: '*As a nurse I am able to answer a text message'*.

A hearing was conducted (July 2012), where the users could comment on the functionalities of the app. The user stories were sent by email to the project group and the nurses on the postnatal ward, and were also presented to the nurses, midwives, doctors and the management at staff meetings.

Because of the participants' input, the proposed functionalities were changed during the hearing. The original six proposed modules were reduced to the following three:

1. Asynchronous communication: online chat, where the families could send text messages to the healthcare professionals as well as photos and videos, and receive an answer within four hours. This method of communication might lessen the impact of, or remove, the barrier of access to healthcare professionals after hospital discharge.

2. A knowledgebase, consisting of information material with a search function for easier access to information. The information material was evidence-based and written and compiled by the nurses on the ward. The information material consisted of written material and instruction videos about the postnatal period, for instance breastfeeding, the concept of skin-to-skin, the mother's recovery after giving birth, practical advice about baby care, the wellbeing of the baby, baby clues and how to bathe the baby.

3. Messages sent out automatically every 12 hours from the time of birth. The messages relate to the age of the baby and should be relevant to the new parents, because they provide them with information about breastfeeding, the baby's first bowel movement, and so on (Figure 5).
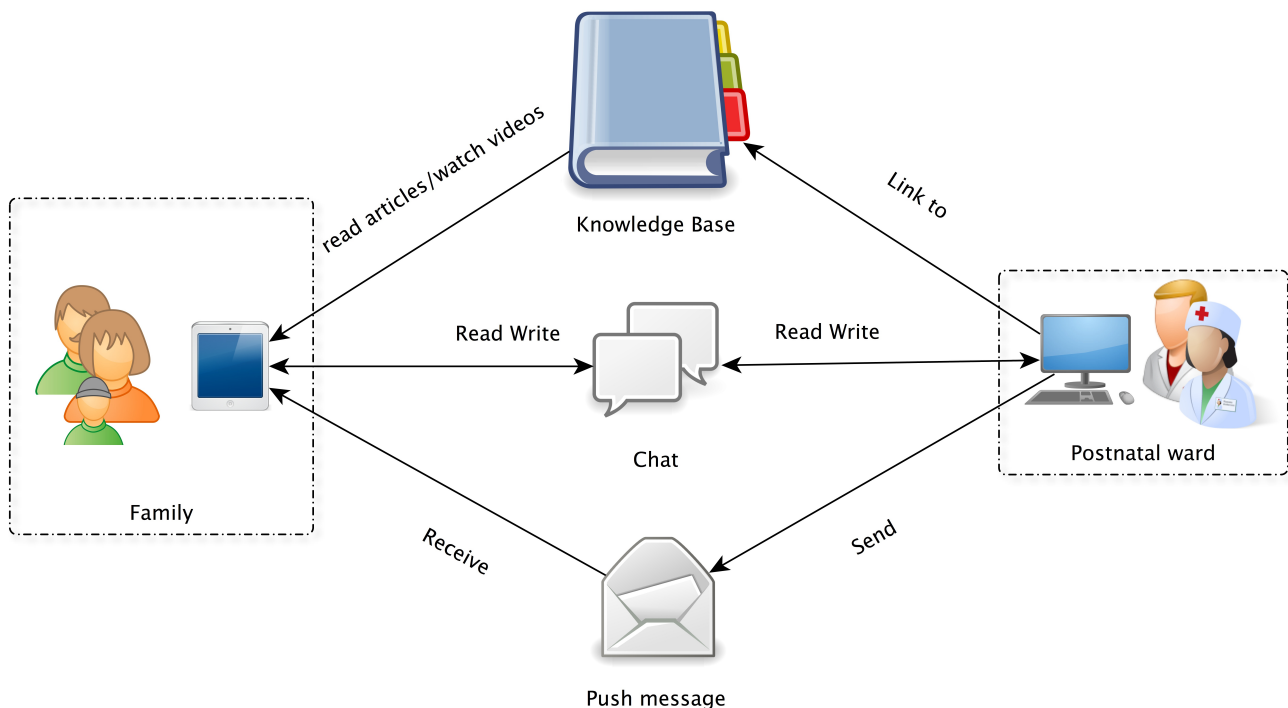
Figure 5. An overview of the functionalities.

A telemedicine solution was designed, which would be used only by the nurses on the postnatal ward. Since the beginning, the project had involved all the professionals on the obstetric ward. However, the reality of the application of the technological options and the descriptions of the new parents' needs, meant that the design proposal became tailored to be used solely by nurses. Therefore, the project group was reduced to two nurses from the postnatal ward.

Development of the 'Me & my baby' app

The app was called 'Me & my baby'.

In August 2012, the development of the software began. The 16 nurses on the postnatal ward were invited to participate in the development process, and two nurses were primarily responsible for the development of the content, such as the information material in the knowledgebase. Some of the content was adapted from existing information pamphlets and digitalised.

The next step was to develop the content for the automated messages. The nurses had written down the topics about which they would normally inform and instruct the new parents in the first postnatal days. These were rewritten into short messages that the new families would receive every 12 hours for the first four days after their baby was born. The messages, included relevant links to

the knowledgebase, where more comprehensive information could be found. The following is an excerpt from one such message:

'24 hours after giving birth. Your boy should suck efficiently at least 6-8 times a day. Your baby will often wake up and show signs of hunger, if not, you should wake him up. Read more about that here: 'Make a good start' and 'Breastfeeding'.

The team of computer programmers developed the software for the app and the accompanying website, where the nurses were to register the new parents and reply to the messages.

The software development consisted of six development periods of 14 days in which specific work was completed and made ready for review. A planning meeting preceded each period, where the tasks for the development period were identified. The team who participated in the planning meetings consisted of the researcher, the development team and a nurse from the project group. We met either face-to-face or via Skype.

A review meeting followed each period, where the completed work was presented. At the review meetings, we also reflected on the previous period in order to make continuous process improvements. We discussed the retrospective questions: *What went well? What could be improved?*

The solution developed for the patients was an iOS app, which is the mobile operating system for Apple. The app was built for Apple iPad devices. A web app was developed for the healthcare professionals.

A graphic designer designed the graphics (See appendix C for screendumps from the app).

During the development process, the nurses on the ward were involved, both in informal conversations at coffee breaks in the staff room and at more formal information meetings.

Pilot test

Once a prototype had been developed, an internal test was conducted with the researchers, one nurse and the team of computer programmers.

The app was then tested in a pilot study for a period of two months (December 2012 to February 2013) with nurses and newly discharged families. To test the app, we procured ten iPads. The new parents were allowed to take home on loan an iPad on which the app had been installed. They had access to the app for seven days. They had to return the iPad to the hospital in a prestamped envelope after the seven days. Several practical questions had to be addressed before the app could be tested in the pilot, for instance, issues of hygiene regarding the iPad, how the nurses should sign the messages and, not least, nurses' concerns regarding the new ways of communicating – the shift from verbal, face-to-face or phone communication to written communication. Charlotte Bjørnes,

who had a conducted a similar project, was contacted to ask her about her experiences in preparing for her pilot test (86). Ahead of the pilot test, members of the project group instructed the nurses in the use of the app and the accompanying website. A user guide to the website was created for the nurses and made available at the nurses' office.

The nurses registered the new parents on the website and used it to check for messages. The nurses were responsible for the online chat, which in practice meant that they had to check it every four hours and send replies. Two of the nurses were responsible for updating the knowledgebase. These new tasks were additional to the nurses' already assigned duties. No extra time was allocated on their shifts for the additional task of answering messages.

Data collection

As part of the pilot test, participant observation was carried out on the postnatal ward for a period of two months and for, on average, 14 hours per week. The observation was primarily based on active participant observation and informal conversations with the nurses. The observations were actively conducted; while observing, the first author also helped to inform patients and assist with technical issues. Field notes were taken concurrently, in accordance with Spradley's recommendations. Subsequently, individual telephone interviews (n=10) with parents (9 mothers and 1 father) were conducted. An interview guide was compiled (Appendix A4). It focused on the following themes: (1) the functionality of the app, (2) the app in relation to the new parents' follow-up support needs, and (3) communicating online. Field notes were also taken during the interviews. The interviews lasted between 15 and 25 minutes.

Results

The categories that emerged from the data analysis of the observations and the interviews were *new working routines, functionality of the app, and new ways to communicate.*

New Working Routines

The nurses found the online chat challenging and did not always check the chat every four hours. Reasons given for forgetting to check the online chat were that the nurses were too busy and there were challenges in adopting a new and unfamiliar routine; the nurses had to go to the office to check the chat, while they usually spend most of their time in the patients' rooms or the nursery room. As a consequence, they sometimes overlooked a message that had been received.

Functionality of the App

The nurses reported that the website was easy to use. They had no problems in accessing the site, logging in, registering new patients, and so on. The majority of the nurses did not have that much

experience with apps and tablets, and they felt it was a challenge to introduce the families to the app because of their own insecurity.

On the contrary, the new parents were, in general, familiar with using apps; most of them had a smartphone or a tablet. They found that the app functioned well and was easy to use, and they did not request more information or guidance on its use.

Most of the families had a WiFi connection at home, and there the app worked optimally. However, when away from home and reliant on 3G, they found that, in some locations, the mobile 3G Internet access was not strong. This meant that, in some places, PDF files from the knowledgebase could not be downloaded and the videos could not be played.

New Ways to Communicate

The use of an app provided new methods of communication. For example, the families liked the option of watching a video showing different breastfeeding positions. They emphasized that it was an advantage to be able to repeat the video if they wanted to check anything they had seen.

The possibility of sending photos to the hospital provided a new dimension in the exchange of information over a distance and reduced the need for some families to attend the hospital for a checkup.

The new parents found it reassuring to be able to send photos, and the nurses found that the quality of the photos taken with the iPad camera was good enough to make assessments (e.g., of the umbilicus), although the importance of good lighting was underlined.

The families valued the automatic messages, and they provided them with individualized and timely information.

The parents experienced that it was easy to contact the healthcare professionals via the app, and they explained that this was why they did not hesitate to contact the nurses if they had any doubts. On the contrary, however, the nurses saw it as a challenge to engage in online chat with the families. They worried that their answers were not clear enough, but at the same time they acknowledged that there was also a question of getting used to this new way of communicating.

All in all, the new families and the nurses found the app to be viable, which is why we decided to continue to explore the app more thoroughly. The app required some refinements and some changes had to be made to it. Because in some areas it was a challenge to use 3G because of a weak signal, we therefore cached the knowledgebase, thereby making it accessible off-line. The knowledgebase was originally designed to allow users to source articles on demand. However, we decided to provide a bulk download and cache the complete data set when the data set was changed.

Some design changes had to be made – *the search function*, which was regarded as important and essential due to the results from the first phase, had to be redesigned. However, it wasn't visible enough. In the second version of the prototype, it was moved to the front page of the app.

The nurses had reported that the website was easy to use and they had no problems in accessing the site, logging in, registering new patients, etc.

Based on the results of the pilot test, the computer programmers worked on the items to be changed. In March 2013, the intervention could begin.

PHASE THREE

INTERVENTION

We wanted to get a deeper understanding of how parents and nurses experience using an app; therefore, we tested the app more thoroughly in an intervention. The aims of the intervention phase were the following:

1. to explore how postnatal parents experience the use of a telemedicine solution, when discharged early, i.e. 24 hours after childbirth, by investigating if they consider that their postnatal needs are met and whether they experience a sense of security and parental self-efficacy.

2. to explore how using an app in nursing practice impacts on nurses' ability to offer support and information to postnatal mothers who are discharged early and to their families, in a way that will enhance the families' sense of security and self-efficacy.

Intervention

The intervention ran from March - August 2013. The app was tested in communication between hospital staff and parents at home.

Forty-two new mothers were recruited from the postnatal ward in accordance with the inclusion criteria, i.e. postnatal mothers discharged early – no later than 24 hours after delivery. The inclusion criteria adhered to the postnatal policy, i.e. mothers who had had an uncomplicated pregnancy and birth. The midwife or nurse made the assessment.

Only physically and mentally healthy adult parents of term, healthy newborns were included. The exclusion criteria were mothers who did not speak Danish.

Due to the participatory design, both the researcher and the nurses on the postnatal ward included the mothers. The mothers received oral and written information about the project and were given time to consider their participation.

Convenience sampling was applied (87) i.e. the sampling process had to be feasible for the nurses during their busy working day. Due to the convenience sampling, we did not systematically register the mothers who did not wish to participate. But the impression was that only a few mothers declined to participate; one said that she was not into technology and another explained that she did not feel the need for extra help, since it was her fifth child.

Once agreement to participate was received, both parents filled out a form on which they provided demographic details. The parents were given an iPad to take home on loan on which the app was installed. They had access to the app for seven days. They were to return the iPad to the hospital after seven days in a pre-stamped package.

Besides access to the app, the families still had access to conventional postnatal care at the hospital.

Data collection

The mothers were recruited on either the delivery or postnatal ward. Both parents were invited, as they both had access to the app. A SMS was sent to arrange interviews with the parents. After three contact attempts without a response, we decided not to disturb them further.

Fourteen sets of parents did not attend for the interview. Two sets of parents were excluded due to technical problems. Two did not want to participate in an interview after all: one mother explained that her Danish was not good enough[1] and one did not have the energy. Three sets of parents cancelled the interview appointment. Seven did not respond to our text messages and phone call. It appeared to be difficult to make interview appointments due to the circumstances involved in having a newborn at home.

Individual interviews (n=28) were conducted with 27 mothers and 11 fathers. Both parents participated in 10 interviews: 17 interviews were conducted with mothers alone, and one father was interviewed alone. Of the total, 21 interviews took place at the family's home. Seven were telephone interviews.

Six mothers were discharged directly from the delivery ward. Twenty-two were admitted to the postnatal ward and discharged within 24 hours after delivery. Seven mothers were first-time parents, of whom one mother was discharged directly from the delivery ward.

Two were readmitted, one with problems related to breastfeeding and the other with sepsis caused by mastitis. They were still interviewed, however, as they of course could contribute their experiences of using the app.

The parents' ages ranged from 19 to 44. All of the parents lived with their respective partners. This was by coincidence and not part of the inclusion criteria. The educational level of the parents

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[1] This was the mother's own assessment, which of course was respected. As she had been included in the study, the nurse who included her had assessed that her level of Danish was adequate.

ranged from secondary school to higher education. Twenty-four were employed, one was unemployed and three were students.

A semi-structured interview guide was compiled and included the themes that we wanted to address and suggestions for questions. It was developed with inspiration from the theories on self-efficacy and postnatal sense of security (20, 25)(Appendix A5). The guide focused on the following themes: 1) Experience of technology, 2) The app in relation to their individual postnatal follow-up support needs and access to the healthcare system, 3) Their feelings of security and parenting self-efficacy and 4) Communicating online and in writing.

The interviews lasted between 11.43 and 76.22 minutes, on average 34.64 minutes, and were audio-recorded and transcribed verbatim.

Participant observation was carried out on the postnatal ward from March to August 2013, on average one day a week and for a total of 20 days. The data were primarily collected during day shifts and five times during evening shifts. The nurses were not followed through an entire shift, because the focus was on how they experienced using the app in their nursing practice and the impact it had on their ability to offer support and information to early-discharged postnatal mothers. The data from the participant observation are based on informal conversations with the nurses. The informal conversations took place during the nurses' coffee or lunch breaks, or in the nurses' office. Sometimes, they spontaneously started talking about the app, while at other times I would ask a question to initiate a talk. Occasionally, I assisted them with practical advice or help concerning the iPads or the website, which automatically led to conversations about the app and how they experienced using it.

Field notes were taken concurrently with a focus on place, participants and activity. The following served as a guideline for the observations: what happens at the time of observation and what intentions and feelings occur in the situation.

Two focus group interviews were conducted in September 2013. All the nurses on the ward who had taken part in the study were invited to a focus group interview. Nine out of a possible 13 nurses attended. The number of participants who could attend on the chosen dates determined the size of each group, which ended up being four and five, respectively. The focus group interviews were held in the employee staff-room on the postnatal ward.

Before each focus group interview commenced, the moderator (the author) introduced the purpose of the interview and clarified the guidelines and the focus: working with an app when mothers are discharged early.

A semi-structured interview guide was compiled (Appendix A6). The overall theme focused on the nurses' experiences, which formed the basis of the discussion. Some additional questions were asked during the discussion. The development nurse on the ward participated as co-moderator, made notes during the interviews and evaluated the atmosphere and interaction.

The focus group interviews lasted 44 and 55 minutes, respectively, were audio-recorded and transcribed verbatim.

Results

The data analysis from the interviews with the patients identified the following overall categories: *Timely information gives a feeling of control, support and reassurance; Technology provides an accessible means of informing, supporting and guiding new parents; written asynchronous communication offers an accessible way to seek help after early discharge.*

Timely information gives a feeling of control, support and reassurance

Both first time and multiparous parents underlined that timely, continuous information was required when the mother was discharged early, because they could not retain too much general information during the short hospital stay. Therefore, the automated messages issued every 12 hours from the time of birth were well received. They found that it was acceptable to get the information in writing instead of orally and, again, they stressed that it was valuable to get the information at times when it suited them. Despite the fact that the messages were automated and to some extent 'generalised', the parents found that they offered them individualised information.

Both first-time and multiparous parents read the messages. The multiparous parents pointed out that it was a quick way to be updated. Even though they were experienced parents, they felt that there was so much that they had forgotten and they considered that the automated messages provided reassurance that everything was ok.

The majority of the parents would like to receive more messages. Some of the mothers wanted more information about their own recovery. Others would have liked it to be prolonged.

They explained that they also had a need for timely information after the seven days and that it also could have been of help during pregnancy. They could read the messages to get a quick overview and, if they had further doubts, they could look at the interactive links for more thorough information. However, two mothers felt stressed by the messages and thought it would have been helpful if the messages had been made clearer.

Technology provides an accessible means of informing and supporting new parents

The information appeared to be more accessible when digitalised rather than in paper form. It was easier to get an overview of the information material and search through it by themselves instead of asking someone for help. The app also offered the opportunity to watch a range of instruction videos, e.g., different breastfeeding positions, how to wash the baby, etc. They emphasized that it was an advantage to be able to watch the videos whenever they had the time and that they could watch a video repeatedly if they did not understand the information the first time. They compared it to face-to-face guidance with the healthcare professionals on the postnatal ward and pointed to the fact that a short hospital stay could be hectic, because they received so much information and guidance within a relatively short period of time. It could also be stressful to have to attend an information meeting at a specific time, because the baby might need to have its nappy changed or it could clash with breastfeeding times or having visitors.

Written asynchronous communication offers an accessible way to seek help after early discharge

The parents found it easy to contact the healthcare professionals via the app with the online chat. They described that they did not hesitate to contact the nurses if they had any doubts, as opposed to having to make a phone call and perhaps disturb the nurse in her work. They used the online chat in favour of calling the nurses. They also mentioned that there was a risk that they would forget some of their questions if they were on the phone. It was easier to remember questions when they could write them in advance and in their own time. The answers from the healthcare professionals were also easy to understand, even though they were in writing.

The option of sending photos to the hospital reduced the need for some parents to attend the hospital for a check-up. A mother who lived 40 minutes away from the hospital used the opportunity to send a photo to the postnatal ward, because she was worried that there was something wrong with the umbilicus.

The mother's early discharge was given a great deal of consideration, with both positive as well as negative opinions between parents and ambivalent feelings within individual parents.

Most of the parents felt that they had taken part in the decision about when to be discharged, but some of them also said that they had been told that they <u>had </u>to be discharged within 24 hours if everything went well. The new parents emphasised that it was important to them that they had a say in when they were discharged and that they did not have to fit in to a standardised care framework. On the positive side, they underlined the importance of being together as a family, when at home. This applied especially to multiparous parents. Some of the parents who felt insecure saw the app as a lifeline. It seemed that the app gave access to the healthcare staff while also encouraging parents

to act more independently, as they searched for information themselves. Some pointed out that they had perhaps looked things up that they wouldn't have asked about.

The categories that emerged from the data analysis of the participant observation and the focus groups with the nurses were:

An app as a means of providing support

An app as a means of conveying timely and accessible information.

An app as a means of providing support

The nurses were hesitant at first when they had to chat online with the families, i.e. using written instead of verbal communication. Another concern was that, when communicating in writing, one uses fewer of the senses. However, after a period of time using the app, the nurses no longer felt that it was such a big challenge or that it involved changes to their work. However, they did state that a lot depended on the type of questions that they had to answer on the online chat. Messages that were accompanied by, for example, a photo of an umbilicus, were considered 'easy' to answer, whereas questions about breastfeeding were more difficult, since more information and dialogue was required in order to make a judgment and give the appropriate support.

The nurses stressed that the written communication cannot 'stand alone', but they emphasized that there was always the option to invite the parents to come to the ward for more guidance face-to-face, and that this occurred on occasion.

The nurses had to check the chat for messages every four hours, which proved to be a constant challenge. Explanations given for forgetting to check the online chat were that the nurses were too busy and there were challenges in adjusting to the new procedures; the nurses had to go to the office to check the chat, while they usually spent most of their time in the patients' rooms or the nursery room.

The app gave the parents the option to stay at home, while, for instance, having the baby's umbilicus assessed, because they could send a photo. The nurses found that the possibility of sending photos was an advantage, instead of the parents having to explain what the umbilicus looked like, over the phone. It provided the nurses with a more accurate impression of the umbilicus, and they experienced that it made it easier to provide the appropriate advice and support. The nurses also discussed that the new parents were reluctant to call the ward for help, even though the nurses told them that they should always call if they had any doubt when they had been discharged. They thought that it was because the parents had experienced that the nurses were busy, and then they didn't want to disturb them. The nurses experienced that the app gave the families an

opportunity to make contact with them after discharge, where they wouldn't feel that they were intruding.

An app as a means of conveying timely and accessible information

The nurses emphasized that one of the advantages of the app was that the information material was in digital instead of paper form. The nurses said that a lot of information material was handed out at the hospital, and they questioned how much of it the families actually read. They considered it an advantage that it was now in digital form, as it seemed to appeal more to the families, because they could easily access it on the iPad and they could also search within the material in the same way as using 'Google' or other search engines.

Another aspect of the information provided was a set of instruction videos. The nurses experienced that this was a suitable way to provide the new parents with guidance. For instance, the nurses on the ward showed the parents how to bath the baby, but this was at a fixed time during the day, and if the parents watched the video, they could repeat it whenever they wanted. They also found that it was easy for them to refer to a video or to a written instruction.

The nurses said the parents reported that they felt secure with the app. They knew where to look for the information, and at the same time they knew that they could easily get in contact with the nurses on the ward.

The nurses had to adjust to the new early discharge policy. It made them feel stressed, because they had a shorter time with the individual family. The nurses expressed that it was reassuring to know that, when the families were discharged with the app, they were drip-fed information in the form of automated messages. It relieved some the pressure they might feel when discharging mothers early, in terms of the duty to 'have informed thoroughly enough'.

The nurses regarded the automated messages that the families received as a tool to stimulate the families' curiosity and their capacity to take control of their situation. The nurses believed that, because of the interactive links in the automated messages, when the parents read the messages, they could easily read additional information material in the knowledgebase, or they could address a question to the nurses on the postnatal ward. The nurses experienced that the parents took control of their situation, and the messages made the parents feel well prepared for the postnatal period. The messages served either to reassure them or to allow them to react, if they required more information or support.

Implementation seminar

After analysing the results, the results were presented during coffee meetings on the ward. These informal meetings were also used to discuss the results and evaluate whether the nurses were interested in continuing to use the app as part of their postnatal care. There was an agreement to

continue, and therefore we decided to hold an implementation seminar. The management and the charge nurse were invited. The results were presented and it was decided that they wanted to continue with the use of the app, but that it required some technical changes, suggested by the results.

ETHICAL CONSIDERATIONS

Respect for the participants must be the researcher's first consideration, ensuring that the participants are not harmed by taking part in the research. This consideration takes precedence over the objective to create new knowledge.

The idea for this project emerged from an actual practical problem involved in the implementation of early discharge policy. We considered that the project was warranted and relevant. The whole idea of PD is the intention to transform practice in a way that reflects the participants' ideas (88).

Brinkmann states that the research must be loyal towards the participants' descriptions of their experiences (76). This is in line with PD, where a core principle is to acknowledge participants as experts in their own life and practice (i.e. being a new parents and nursing practice) and it presumes respect for their expertise and experiences (88). Participatory designers seek ways to fully engage people in the design of their own future, which is reflected in the motivation behind the methods developed in PD.

In traditional ethical reviewing, informed consent is a key concept, which should guarantee that the participants are informed about the project in which they are participating. In a PD project, informed consent should also take account of conditions that do not necessarily apply to a research project, because the 'outcomes' are usually open and not known in advance. This needs to be addressed to the participants, so they know that the project might change as it develops. In our project, the participants received oral and written information about the study and were informed about their rights in relation to participation in a research study, in compliance with the Helsinki Declaration (89) (see Appendix D for example). All participants gave oral consent. Those who participated in interviews and workshops provided informed consent in writing (see Appendix E for an example). Additionally, the healthcare professionals were continuously given information about the development of the project at meetings, in emails and by way of the weekly newsletter from the management. In the early phases of the project, the participants were informed carefully about the intention of the project, which involved an open process, meaning that we did not know in advance whether the project would end up with a design proposal or how it would transpire.

The healthcare professionals asked the new parents if they would like to participate, and then I, or a nurse on the ward would inform them in detail about their participation and they could decide whether or not they wanted to participate.

Another ethical issue concerns participants' confidentiality and anonymity. In our project, it was constantly stressed that whatever was said at the interviews, workshops and as part of the participant observation would be treated confidentially, and that all quotations or references to the project would be anonymous. Anonymity of the participants was addressed by numbering their identity in field notes and interview transcripts using codes known only to the researcher.

Qualitative studies often address issues that concern people's intimate sphere, and it is essential to assess the risk of emotional distress for the participants. In our case, we had to consider how much we would disturb the participants, in their new life situation with an infant. It was underlined that they could, of course, bring the infant to the interviews and workshops that took place at the hospital, and that they could resign from the project or cancel or rearrange appointments.
New parents are in a vulnerable situation and the experience of participating in a research study is likely to be an additional burden. However, when people have an opportunity to talk about their own experiences, they may gain meaning and understanding through telling their story, which may be helpful when adapting to a new situation (90). We did not want to exclude the voices of the parents, because they represent an important voice when designing technologies for early discharge. Some of the participants in the problem identification and design process showed interest in the project, while they participated in both interviews and workshops. Throughout the project, we endeavoured to be attentive to, and meet, the participants' needs and wishes in relation to interview time and location. The parents participated in identification of needs and design phase but, considering the time and energy that they had already spent on the project, we decided not to disturb them further, so they did not participate in the actual development process in phase 2 with respect to their new situation.

PD projects strive to produce useful systems or applications that are responsive to the participants' needs and practice. But an important question to ask is: what happens if that is not possible? In our case, we have tried to underline throughout the research process that we could only change practice within the existing policies, emphasising that changing the new early discharge policy was not an option. The aim was to try to find a solution reflecting the needs of the new parents, *when* they were discharged early. It is important to adjust expectations in line with what is actually realistic for the researchers to offer the participants.

Another point to register is that the emerging design is not always applicable to the participants who have created it. This was the case in our project. The new parents who participated in the identification of needs and design phases, never actually benefitted from the designed solution, since it was no longer relevant for them.

Often a project ends before the users are supported in integrating what has been designed in their everyday practice. This was a concern that was taken into account in the actual project, where a redesign of aspects of the app supported the integration of the app in their everyday practice.

The study was submitted to the Scientific Ethics Committee. The committee decided that approval from an ethics committee was unnecessary according to national legislation in Denmark (S-20110171) (Appendix F). The Danish Data Protection Agency registered and approved the study (2008-58-0035) (Appendix F). A data processing agreement was made and signed by MedWare, the IT Company that developed the app and were responsible for the operation of the system. Throughout the research process, the generation, handling and publication of data were consistent with the guidelines of Danish research ethics committees and the Danish Act on Processing of Personal Data.

The nurses registered patients using a website. They had to log on with a personal login name and password. The parents logged on to the app by using their social security number and a password. The transmission of data between the app and the website was encrypted in compliance with Danish safety and security legislation.

DISCUSSION

The results are reported in the previous sections, which describe the research process. This section works across the phases of the research process to discuss the methods used, limitations and the results.

Methodological aspects

The starting point was a change in Danish national postnatal policy. We wanted to find new ways to support parents discharged early following childbirth, by investigating the needs of early discharged mothers and their partners, designing and developing a solution, exploring how they experience it and whether a telemedicine solution could ensure a sense of security, wellbeing and self-efficacy. To this end, it seemed relevant to use PD as a methodology. Participatory designers seek ways to fully engage people in the design of their own future, which is reflected in the motivation behind the methods developed in PD (52). It has been shown to be suitable as an overall design for the

project in involving participants in designing a solution to meet the needs of new parents. The methods and the user activities applied were supportive in first identifying the parents' needs for postnatal care after being discharged early, and were valuable in the design phase, where the activities facilitated the participants to come forward with their ideas for potential solutions, as well as in the use of technology (91).

We conducted a pilot test and intervention before implementation as recommended by Clemensen (54), where the research phase is extended beyond the development of a prototype. Both the pilot test and the intervention in our study generated findings of importance for both the research questions and the following implementation.

A central consideration in a PD project concerns the descriptions of the participants' practice, which are intended to be used in shaping future practice. The description is critical, because they can fail to represent the perspective of a group of participants, or miss certain important perspectives (88). Therefore, we used a range of methods that included participant observation, which can reveal unspoken aspects of practice, as well as more participative methods and activities, such as interviews and workshops. We involved healthcare professionals as well as new parents to get diverse perspectives on early discharge to minimise the risk of failing to represent the perspective of a user group.

In analysing the data, we used Systematic Text Condensation (STC), which was suitable because it involves accurate descriptions of how the participants experienced early discharge, and the use of the app. When applying STC, the synthesis of the participants' practice and experiences must be communicated so it is loyal to the participants' voices and the observations conducted. STC proved to be valuable in describing the participants' practice and experiences, because it did not neglect the perspective of the participants.

When applying PD, it is important to ensure that the methods and user activities are used so that they fully engage the participants (91). Throughout the project we have continually discussed the participation of the users and also considered who to engage and how much (see the Ethical considerations section), as well as the flow between the methods and activities applied. We applied semi-structured interview guides with open-ended questions to ensure a participatory mind-set with a focus of the participants' experiences, giving them the chance to say what was important to them, so they weren't limited by closed questions.

Commitment to change is a central element in any change process (56). To what extent are the participants actually prepared to change their practice? In our case it was a mandatory change that initiated the project. This might have had a positive impact on their commitment, because the participants (especially the healthcare professionals) were eager to engage in a project where they

would have a say. They had experienced that the new policy was decided *despite* their objections made during the hearing. However, now they could actually participate in the process of finding a solution where their voices were heard (92).

Both the management and the practitioners were committed to change. Some of the participants were, however, reluctant to use the technology in the beginning. It was sometimes a struggle for the nurses to attend a workshop or an interview, because they couldn't leave the ward, if it was too busy. This presented a challenge to their participation.

Not all the nurses on the ward were equally engaged with the project, which could reflect their engagement at their workplace, their interest in the project or how they felt they were involved. I have not explored this in depth, which could have been valuable to inform the processes of a PD project. The focus has been the PD process as well as the participants' experiences of the developed technology, and therefore it was not possible to evaluate the nurses' experience of participation. Yet, the results from the focus group interviews imply that the nurses felt a sense of ownership of the solution and, indirectly, this could indicate that they experienced that they have been actively involved in the process.

However, some of the nurses were more actively involved than others. According to Bødker et.al., this is a typical problem (56). Differences can arise between the users in the project group and other staff members, because users in the project group gain a greater understanding of, and insight into, the project. In our project, we involved the other staff members in order to ensure participation from as many as possible among the users. However, it was not possible to have all the staff members actively involved in either interviews or user activities.

We also established a large project group, which consisted of eight users to begin with: five nurses, two midwives and one doctor, to have representation from the different professions, to reflect the interdisciplinary character of the obstetrics ward and to comply with the users' interest in participating in the project group.

The group of participants in the study also changed over the period of the project. At first, we involved the nurses, midwives and doctors at the obstetrics department, as well as some of the new parents. As the project developed, however, the participants were confined to nurses on the postnatal ward and new parents. There had been a shift in management, and changes among the nursing staff on the ward. Furthermore, the new parents who designed the solution were not the same as the ones who tested it.

Validity, reliability and generalisation

Qualitative research aims to understand a phenomenon and to provide guidance for future situations, for example how to organize early postnatal discharge. The terms relating to quality evaluation have been discussed (76). Because reliability, validity and generalisation are rooted in the positivist perspective, they should be redefined for their use in qualitative research, taking into consideration this different epistemological approach. I use the terms as interpreted by Kvale (63).

Validity

According to Kvale, for knowledge to be considered valid depends on how truth is regarded. The historical perception of knowledge as a mirror of reality has been replaced, and now knowledge is also regarded as a social construction, where truth is constituted through dialogue. In relation to this specific study, dialogues were an essential method to gain insight into the participants' experiences, not only to identify the needs of the early discharged parents, but also to design a solution and gain insight into how the participants experienced the technological solution.

According to Kvale, validity refers to whether a method actually explores the stated objective of the research and to what extent the observations actually reflect the phenomenon investigated. A valid conclusion can be accurately reckoned from these premises.

In ensuring the validity in this study, we gave detailed descriptions of the theoretical perspective, the characteristics of the participants and the research process to enhance trustworthiness. The co-researchers critically analysed the data together and a systematic model for analysing data was applied. When presenting the results, numerous quotations from the participants' original statements were provided.

Validity also depends on the researcher's ability, including reflexive skills. My own engagement in the field can be seen as a strength of the study, because I know the field in detail. However, it could also be difficult to be open and I could have blind spots and might perceive the material in a certain way because of my preconceptions. I endeavoured to approach the field with an open mind, and involved my co-researchers in the data collection, where one of the co-researchers participated in the focus group interviews and the workshops. I also approached the data material with an open mind, raising questions about other ways of seeing and interpreting the material. My co-researchers participated in this process, and we could ask questions of each other's preconceptions with a view to minimising a subjective interpretation (63, 76)

Another aspect of validity is member checking, where the data analysis is presented to the participants. The intention is to find out if the reality of the participants is captured. Lincoln and Gaba (93) state that member checking is important for establishing credibility. Member checking

was conducted, in some sense, because of the nature of PD, where the results of the analysis are used in the design process and the participants are presented with the results and they can have a say about whether it reflects their needs and ideas. Yet we have preceded it with caution because it could jeopardise the anonymity of the participants.

Reliability

When evaluating whether the results are reliable, an assessment must be made about how the data were generated, how the analysis was conducted and how the results were presented (63, 76). The data were generated using a variety of methods. During the participant observation (phases 1, 2 and 3) and during the interviews (phases 1 and 2), field notes were written on the spot and as precisely as possible.

During the interviews, the participants were asked open-ended questions and the participants could unfold their experiences. The interviews (phases 1 and 3) were recorded and transcribed verbatim. The analysis was conducted together with co-researchers to increase the reliability. The analysis process has been presented in tables to make the analysis transparent (Table 1 and articles I-IV). When presenting the results, quotations from the interviews and examples from the participant observation were used to make connections to the participants' original statements.

The data were in Danish. In the process of translation into English in collaboration with a translator details could have become nuanced differently.

Transferability and generalisation

I gave rich descriptions of how the participants experience early discharge after childbirth, as well as the process of designing and developing the app, and their experiences of using the app in relation to early discharge and a sense of security, wellbeing and self-efficacy. These rich descriptions allow readers to make their own judgments about whether the work is potentially transferable to their own contexts, settings and situations. Unlike a quantitative study, the results cannot claim statistical generalisability. Another form of generalisability must be used, which is based on a theoretical understanding of the phenomena. Analytical generalisation emerges by means of the dialectic between theory and practice (63, 76). The empirically generated data were brought into dialogue along with the theoretical preconceptions, relevant studies and theory explored during the research process.

Analytical generalisation presupposes a detailed description of the research process. The current thesis and the original papers intended to do so by unfolding the details in the process, which should contribute to making the process transparent. Whether the results can be regarded as decontextualized is an interesting question. The material was decontextualized in the STC process;

however, when using the results elsewhere, attention must be paid to differences in relation to context.

Limitations

A limitation is that this was a small-scale study. It was not the intention to generalise, but rather to understand and explain how new parents experience the use of an app in the postnatal period after early discharge.

The study was conducted only on one ward, and in a limited context. It could have been a strength if I had been doing fieldwork on different postnatal wards to get inspiration for other ways of organising the postnatal care.

Another limitation is that we only interviewed just over half of those who had used the app. Future research might need to consider ways to overcome the difficulties of getting feedback from this group of participants, maybe a questionnaire build into the app.

For further elaboration of limitations, please see the papers.

Discussion of results

The overall aim with this study was to explore whether telemedicine could be a possible solution to the support needs of postnatal mothers discharged early from hospital and their families and to investigate how they experience it and if a telemedicine solution can ensure a sense of security, wellbeing and self-efficacy.

The discussion will be across the different phases in the study and covers the four specific research aims from the different phases.

The discussion of the design and development process was primarily a part of the methodology discussion. For a more detailed discussion of the separate phases, the papers need to be consulted.

Parents experience a need for access to support

We found that the need for access to support from healthcare professionals was critical for the parents (Paper I). Other studies have stressed the importance of individual accessible support (94, 95) and that healthcare professionals are available around the clock at hospital. That they can be contacted from home is essential for parents' sense of security (20). Barclay found that a mediating factor influencing the mothers' experiences of motherhood is the nature of social support available. In the process of becoming a mother, the nature of support gained through, for example, relationships with the mother's partner, family, friends and healthcare professionals was essential. The nature of support that the mother receives can affect her experiences in either a positive or negative way (96). This is why the accessibility of professional support, and support from the father and, if possible, friends and family, is central.

These experiences may have an influence on the parents' journey to parenthood, because, according to Rubin, the most vulnerable time in a woman's maternity period is the postnatal period (97). Lindberg emphasises that the postnatal period can be viewed as a transition, where the mother and father move from a well-known reality to an unknown reality (98). Becoming a mother is regarded as a developmental transition that involves psychological, social, and physical effort. A woman experiences vulnerability and faces tremendous challenges as she makes this transition (99). Empirical studies describe 'becoming a mother' as a process starting by realizing and facing the overwhelming situation. At this stage, a mother experiences responsibility associated with feelings of powerlessness, inadequacy as a mother, exhaustion, and ambivalence (96, 100)[2].

Other studies have found that, when mothers are being discharged, it is essential that they are able to get professional support whenever needed (16, 42, 101). Persson has identified that accessibility to support from healthcare professionals is an essential element in the experience of a postnatal sense of security (102-105).

This underlines the importance of access to support. However, we identified that the parents did not experience the requested access to support when discharged early (Paper I). As a consequence, they asked for new communication methods that would ensure access to help, where their needs for more individualized and timely information and support would be met and that would eliminate the barrier they experienced in securing contact with healthcare professionals.

Asynchronous communication gives access to support

We found that the asynchronous communication that the app facilitated was of essential importance in the parents' experience of the app, and they regarded it as a lifeline (Paper III). It is easy to seek help; the healthcare professionals are accessible and the parents do not experience any barriers in contacting the professionals for advice. They do not feel that they are disturbing the staff when writing, in comparison to making a synchronous phone call. Messages with encouraging feedback from healthcare professionals could, to some extent, substitute for the verbal persuasion that the families would receive if they were admitted for a longer duration after childbirth. Encouragement from others is important for enhancing parental self-efficacy (PSE). Bandura also states that, because it is readily accessible and convenient, there are advantages in offering internet-delivered guidance (24, 106).

The importance of access to support is described in the literature as an issue, because even when they have important questions, new parents are reluctant to contact healthcare professionals in case they disturb them (4, 7). We also found that the parents would seek help elsewhere, and this would

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[2] We use the term 'becoming a mother' for both primiparous and multiparous mothers. For a multiparous mother, becoming a mother again is also a transition, involving different stages, even though she has been through it before. We also consider that some of the experiences can also apply to fathers.

involve a risk that some of the advice received from people in their network could be incorrect or not based on evidence.

Other studies within different specialisms have also shown that the asynchronous communication can be a way to overcome this barrier. Bjoernes explored the possibility of online contact between the healthcare professionals and men with prostate cancer (n=34) who experienced short hospital stays. These patients experienced accessibility to healthcare professionals using asynchronous online communication (email). Their need for individualised information and support was accommodated (107)

This shows the potential of asynchronous communication after early discharge.

Asynchronous communication changes support

The nurses addressed the fact that the online chat function changed their way of communicating with the families, and they felt it changed the support they gave to the new parents. This can be explained by applying Ihde's post-phenomenological theory, where he underlines that the technological mediation of human practice shapes our experiences of the situations in which we are engaged. The use of online communication, such as email or text messaging, involves a language-analogue mediation – it is a dialogue, but not like a dialogue that two people have face-to-face or mediated by telephone (108). Technology is not a neutral tool; it provides a framework and invites us to employ certain use-patterns (108-111). When communicating face-to-face or on the phone, they felt they could use more of their senses to assess the patient's expressions or tone of voice and evaluate their emotional or mental state than they could when communicating online. In this situation, as compared to conducting a written dialogue, they felt it was more natural to extend the dialogue to issues other than the one initially addressed.

However, a report from the Institute for Healthcare Informatics (112) on the use of social media shows that patients also use social media for emotional support, which indicates that it is no longer only through face-to-face dialogue that people feel they can get emotional support. The report concludes that there have been essential changes in the way people communicate and, as a consequence, the new technologies will change how healthcare operates on a global scale (112). This development is also underpinned by a review by Plantin and Daneback (113) that showed the majority of today's parents not only search for information, but also for social support on the internet. As a result of this development, and because of the reduction in face-to-face contact, it has become more common for hospital staff to communicate both online (44, 114), and offer telephone support (115) following early discharge.

The transmission of photos is reassuring

We have shown that parents find it reassuring to be able to send a photo via the app to the hospital, and have an assessment of, for instance, the baby's umbilicus.

The transmission of photos gives new options compared to phone-mediated contact. A photo can 'say more than a 1000 words' (108), where the nurses can actually see and observe instead of both families and nurses having to rely on written or oral descriptions over the phone. Other studies have pointed out further advantages for patients in staying at home instead of going to the hospital, in terms of time saved on travelling and waiting for a consultation (116).

This means that the locations where healthcare takes place are changing. Telemedicine offers possibilities to provide healthcare beyond the hospital setting (117).

Automated messages provide timely information

The study showed that a challenge in relation to early discharge appeared to be providing the families with individualised information at the right time (Paper I). They desired that the information would be 'tailored' and easy to access. They found that it was easier to Google certain words than to read through a pile of pamphlets, while using the internet created uncertainty as they were concerned about the reliability of the information, even though it was easily accessible (Paper I). The meta-ethnography revealed that parents turn to numerous sources of information in order to develop more confidence in taking care of the baby, i.e. health professionals at the postnatal ward, general practitioners, health visitors and relatives, as well as books and other written information (Paper V).

We found that the automated messages that parents received every 12 hours for the first four days were suitable to inform and guide them and to prepare them for their new roles as parents. The nurses found that the automated messages served to reassure parents, and this suggests that the messages could potentially have the same effect as verbal persuasion. According to Bandura, verbal persuasion contributes to PSE (24), because the parents become convinced that they can cope successfully. This can contribute to the achievement of a feeling of success.

The parents described the messages as providing timely information, and they felt supported and reassured that their newborn was healthy and that they were in control – all of which are factors in enhancing a sense of security, where a vital factor for the parents' sense of security is that they are being given adequate and consistent information and practical advice (11).

This also relates to the results of the Text4baby mobile health programme, which aimed to provide timely information to both pregnant women and new mothers to help them improve their health and the health of their baby. The results from the pilot evaluation of the programme show that the pregnant women who received the text messages were more prepared for motherhood (118).

Two mothers, however, experienced that the automated messages stressed them (Paper III). It is important to underline that it was not the intention that the automated messages should stand alone, as the app also included the facility to contact the healthcare professionals and the discharged parents also can contact the hospital by phone around the clock for an interactive dialogue with a healthcare professional, which Mercher underlines is a central aspect of support for mothers (99). The automated message facility could also operate as an alert function, in that it could prevent a potentially harmful situation from occurring, e.g., without the messages, parents could perhaps overlook important signs of their baby's failure to thrive (Paper III).

Early discharge can enhance affinity within the family

Early discharge offers the possibility to be together as a family. The new parents indicated that being at home was favourable compared to being at the hospital when it came to being together as a family. In particular, the fathers and the multiparous parents stressed the importance of being together as a family with the newborn's siblings (Paper III). However, the parents highlighted the need for follow-up support when discharged early and they experienced the app as a lifeline, whereby they could seek help and advice.

Other studies concerning new parents' experiences of early discharge underline the importance of being together as a family directly after the birth. Early discharge naturally gave them this option and this positively affected their sense of security. The father took an active role in the care of the baby, because it felt more natural to do so at home and thereby share the responsibility (4, 14, 16, 101, 119). Persson and Dykes also describe how affinity within the family has an impact on PPSS (11). Studies show that one of the central themes in becoming a father is the search for a role and the father's desire to participate in the care of his newborn (104, 120, 121).

The meta-ethnography (Paper V) revealed that several fathers experienced not being invited to take part in caring for the newborn by the health professionals during the hospital stay. Some expressed that coming home made a positive difference in being a part of the new family and thereby being able to take responsibility. This is also found in previous studies (11, 122).

Digitalized information

Using the app also made the parents act more independently, because they could easily look things up for themselves. They reported that, otherwise, they would have contacted the hospital, because it would have been too much trouble to find the information in a pile of pamphlets (Paper III). This was supported by the nurses, who also experienced that the new parents were more likely to seek information themselves when it was digitalized than in paper form (Paper IV).

Acting independently and gaining one's own experience is, with reference to Bandura, a way of achieving mastery experiences, which strengthen PSE (24). Early discharge also encourages parents

to try to manage the baby themselves and thereby gain experiences that might increase confidence in their parental role. This is supported by Bandura's theory of self-efficacy, in which the most important source for increasing self-efficacy is mastery experiences (24, 25, 106). Yet, it is important to underline that it is only successes that build up and make robust one's personal efficacy; disappointments will weaken it – and particularly if they happen before PSE is established.

Videos as guidance

The parents stated that it was an advantage to be able to watch the videos whenever it suited them. They used them in combination with the guidance that they received from the healthcare professionals, if they had doubts when at home (Paper III). This reflects a blended learning approach where face-to-face guidance is blended with the use of IT mediated guidance (123). I will call it *flipped nursing*. The term is adapted from the notion of *flipped healthcare* (124, 125), which was itself inspired by the idea of the flipped classroom (126). A flipped classroom is a form of blended learning in which students learn new content online by watching video lectures. In the 'flipped classroom', students 'attend' lectures at home (in video form) and the homework (assigned problems) gets done in the classroom. In this way, because the teacher's time is not taken up with delivering a lecture, s/he has time to give individual attention to individual students.

The flipped classroom approach maximizes the potential of the teacher-student meeting and puts the teacher's expertise to its best effect. This can be translated to healthcare, where the vision is that new technologies can empower people to be more informed and more engaged when they meet the healthcare professional and better prepared to take care of their health when they walk out the door. It is also assumed that healthcare professionals can advance the ways they communicate and engage with patients during visits, because both the healthcare professional and the patient can be better prepared for the meeting, and thereby make better use of the actual visit with the patient.

They can also take advantage of new tools for supporting and connecting with their patients outside of the hospital.

The parents in our study said that the videos gave them the possibility of seeing others perform relevant activities, e.g., breastfeeding or bathing the baby (Paper III). Vicarious experiences can generate an expectation in parents that they, too, will be able to perform the task, i.e. that if others can do it, they should also be able to achieve success, which can enhance PSE (25).

We found that the nurses also experienced that, when the face-to-face contact was reduced due to the early discharge, the use of instructional videos was a suitable way of informing the new parents (Paper IV). It offers a way to help parents to feel in control of their new situation, which are factors that enhance a PPSS (104, 105).

The organisation of early discharge affects PPSS

Although the parents felt secure after discharge with the use of an app, the fact that they were being discharged early was an issue for consideration (Paper III). This is also found in other studies, and it seems that the overall factor impacting on parents' feelings of security after early discharge is whether they have been involved in the decision and timing regarding discharge and that do not feel that they are being forced out of the hospital (4, 5, 7, 13) This relates with the results from the meta-ethnography (Paper V), where we found that, if the parents did not feel ready to be discharged, it seemed to trap them in the first developmental stages of being a parent; some were left with a feeling of responsibility that was exhausting and overwhelming. Other parents, who felt ready to be discharged, appreciated the responsibility they were given by going home early and gradually built up their relation to the baby and their parental competences by understanding and reacting to the baby's cues. Persson underlines the importance for PPSS that the one is met with a flexible attitude (103). In our case, the healthcare professional took the parents' individual situations into account, and where the parents experienced that were being listened to and taken seriously and where they felt they were able to decide for themselves and take responsibility for their own situation (Paper III). This indicates that parents need to be involved in the decision about when to be discharged.

CONCLUSION

The app is experienced as a lifeline that connects the homes of the new parents with the hospital. The functionalities of this app with the chat, the knowledgebase and the automated messages met the needs of the new parents, who requested accessibility to the healthcare system and that they would receive a response to their concerns, doubts and questions during the postnatal period. The app has the potential to ensure PPPS and enhance PSE.

The written asynchronous communication provides an easy way for the nurses to offer the new parents support, when they are being early discharged, and the parents find it easier to contact the nurses via the app than by phone. This access to the healthcare professionals is considered by parents to be essential in order to ensure their postnatal sense of security. The app diminished the barrier that parents can experience when attempting to contact healthcare professionals after hospital discharge.

The nurses generally tend to focus their actions around providing information, as they do not consider that written communication lends itself to a more open and extended dialogue. This could

be a question of needing more time to adapt to this new way of communicating, considering that the parents experienced it as a supportive method of communication.

The automated messages are experienced as a suitable way of informing new parents and it encouraged them to act independently, which can enhance parental self-efficacy, because the parents are inspired to take action and thereby gain mastery experiences.

The nurses experience that the app offers an efficient way to provide information for the parents as compared to pamphlets, because the parents were more likely to seek information when it was digitalized.

It can be concluded that the use of an app can be a way to support new, early-discharged parents. However, it is important to underline that one of the main contributory factors to feeling secure is the parents' sense of being in control, which underlines the importance of involvement in the decision about when to be discharged. If they don't feel ready to be discharged it may trap them in the first developmental stages of being a parent, which can leave them with a feeling of responsibility that is exhausting and overwhelming.

Although the app could be successfully applied in the nurses' working practice, it gave rise to challenges in their daily practice because of the concomitant changes to their work processes. This had to be addressed before the app was implemented.

PERSPECTIVES/IMPLICATIONS FOR PRACTICE

This study gives new insight into the needs of new parents who are discharged early after childbirth, as well as new ways to organise early discharge. It shows how telemedicine can be of value, from the perspective of both parents and nurses, when it is designed to meet parents' needs and involves the participation of the users in the design process.

The study has resulted in the design and implementation of an app as part of the standard care on the postnatal ward, OUH, Svendborg Hospital. The app was redesigned based on the results of the intervention and in line with the theory and processes of PD that have characterised the study.
It was implemented as part of the OUH app 'Mit forløb' [My journey] and the functionalities of the app have served as an inspiration for the design of related apps used on different wards within OUH. The app is available only for use with iOS (Apple products) because of the difficulties faced in financing the development of the app for other operating systems. This shows that there can be

challenges in introducing new technology within the financial constraints of the healthcare system. It is still possible to lend an iPad to the parents.

There is a general interest in finding new ways to use technology to provide healthcare. This is largely due to modern developments in society and in the healthcare system, which include demographic changes with more elderly people, technological developments and an increasing complexity of healthcare, and organisational changes including centralised hospitals and shorter hospital stays. The results add to the knowledge needed to meet the challenges in organising the future of the healthcare system. The results have implications for the way that postnatal care should be organised, with a focus on the need to involve parents in the decision about when to be discharged and showing how it is possible to meet the needs of early-discharged parents with the use of technology.

This general interest has led to national and international interest in the study, including press coverage and invitations to speak at national and international conferences. This shows that the study is part of the trend that is changing the way healthcare and, specifically, nursing are delivered. It has a great impact on the organisation of the healthcare system in this new age when healthcare and nursing no longer are restricted to being located at the hospital due to the implementation of telemedicine solutions.

However, the use of technology and telemedicine solutions are not solely concerned with being independent of time and place and the delivery of healthcare over a distance. Also on the agenda in the healthcare system is the wish to meet patients' high expectations. Patients expect to undergo an individual course of treatment and care. The patients will expect to be involved in the decisions regarding the process, they will expect to have the freedom to continue their personal way of life and be so-called 'active' patients using diverse forms of technologies. From this perspective, it is fundamental to incorporate patients' needs in the design process of new technologies.

There is also a potential to change healthcare with the use of new tools, technologies and strategies that can enable people to be more informed and engaged in their own health. It can improve the way that healthcare professionals involve and communicate with the patients, not only from a distance, but also before, during and after their physical contact time with them. The potential for *flipped nursing* was shown in the project, where the nurses could take advantage of the new tools also to support and connect with their patients outside of the hospital. The app showed the potential to be such a tool. In the study, we identified that the app connected the homes of the parents with the healthcare professionals at the hospital, and thereby gave the possibility for informing and

supporting. The app has the, as yet, unexplored potential for flipping nursing care, before giving birth, during the pregnancy and also after the first seven days.

The app presents the potential to free us from the boundaries of healthcare that is restricted to the hospital or clinic setting, and could be used, for instance, in connection with postnatal consultations. Prior to their consultation, parents could ask questions of the healthcare professionals and receive messages containing relevant information. Hereby, both parties could meet well prepared for the consultation and render the actual meeting more efficient.

By using these strategies for flipped nursing, the interaction between the healthcare professional and the patient can be, literally, turned on its head – i.e. flipped – and this would motivate better and more meaningful interactions.

FUTURE RESEARCH

The potential of flipped nursing could be investigated by designing the app to be used during pregnancy and the period of access to the app in the postnatal period could be extended.

The potential for the use of the app in postnatal care could be investigated in future research, in a large-scale study. One possibility is to conduct a randomised controlled trial to acquire more generalisable knowledge. It could also be relevant to investigate the cost-effectiveness and clinical effectiveness by conducting a MAST. This is a model for the assessment of telemedicine applications and services that assesses the outcomes of their use. It is a multidisciplinary process that evaluates information about the clinical effectiveness, patient perspectives as well as organisational, economical and ethical issues related to the application of telemedicine systematically (127).

SUMMARY

A new policy was issued in the Region of Southern Denmark in 2011 in which early postnatal discharge was to become general practice following uncomplicated delivery for first-time and multiparous mothers. This presented a challenge to find new ways to provide information and support to families. One possibility is the use of telemedicine.
The aim was to find new ways to provide support by investigating the needs of early discharged mothers and their partners, designing and developing a solution and exploring how they experience it and testing whether a telemedicine solution could ensure a sense of security, wellbeing and self-efficacy.

The chosen research design was Participatory Design (PD), with the purpose of involving the participants. We used PD with a combination of qualitative methods, i.e. field studies, user activities and intervention.

The study consisted of three phases; first an identification of needs phase, where the new parents and healthcare professionals identified support needs after early postnatal discharge. This was followed by the design, development and testing phase. Here, an app was designed, developed and tested between hospital staff and new parents at home following early postnatal discharge. The content, format and style of the app were designed on the basis of the parents' identified needs, in close cooperation with the nurses on the postnatal ward, and with the assistance of a team of computer programmers. The app contains a chat function, a knowledgebase, and automated messages.

The app was at first tested in a pilot test with 10 new families. Thereafter the app was tested more thoroughly in an intervention between March and October 2013 in the Region of Southern Denmark, involving the postnatal ward and 26 new families in their homes.

The data analysis was inspired by systematic text condensation, which originated in Giorgi's descriptive phenomenological method.

The results gave a new understanding of the parents' needs and also suggestions for a possible telemedicine solution. The families requested an individualised postnatal follow-up, timely information and guidance and accessibility to, and new ways to communicate with, healthcare professionals.
On this basis, an app was developed and tested, where it was found that the nurses had difficulties fitting the new work processes into their existing working routines. However, they considered that the app gave them the possibility to offer support for the families discharged early, as it provided families with easier access to timely information and support, and it enhanced opportunities for families to initiate contact after discharge. The nurses addressed the fact, however, that the online chat function changed their way of communicating with the families, which they experienced altered their support to the new parents.

The parents were confident in using an app; they did not experience any barriers in contacting the nurses with the use of asynchronous communication. The parents received timely information and guidance by communicating online and experienced that their follow-up support needs were met.

The app is experienced as a lifeline that connects the homes of the new parents with the hospital.

The functionalities of this app, which includes the chat, the knowledgebase and the automated messages, met the needs of the new parents, who requested accessibility to the healthcare system so that they could receive a response to their concerns, doubts and questions during the postnatal period. The app has the potential to ensure parents' postnatal sense of security and enhance parental self-efficacy.

It can be concluded that the use of an app can be a way to support new parents who are discharged early. Yet, it is important to underline the fact that one of the main contributory factors to feeling secure is parents' sense of being in control, which underlines the importance of involvement in the decision about when to be discharged.
The app could be applied in the nurses' working practice, but challenges to the daily practice arose, around the change of work processes on the postnatal ward, and these had to be addressed before it was implemented.

This study gives a new insight into the needs of new parents who are discharged early, and into new ways for organising early discharge. It shows how telemedicine can be of value from the perspective of both new parents and nurses, when it is designed to meet the parents' needs and with the participation of users in the design process.

SUMMARY IN DANISH

I 2011 blev en ny fødeplan besluttet i Region Syddanmark, som indebar, at første og flergangsfødende uden komplikationer skal udskrives tidligt, dvs. inden for et døgn efter fødslen.
Dette præsenterede en udfordring til at finde nye måder at give information og støtte til de udskrevne familier. En mulighed kunne være brug af telemedicin.

Formålet med projektet var at finde nye måder at tilbyde støtte ved at udforske behovene hos de tidligt udskrevne mødre og deres partnere, designe og udvikle en løsning samt undersøge hvordan de oplever den og derigennem afprøve om en telemedicinsk løsning kan sikre tryghed, trivsel og handlekraft.

Det valgte forskningsdesign var Participatory Design (PD), hvor formålet var at involvere deltagerne. Vi brugte PD med en kombination af kvalitative metoder dvs. feltstudier, brugeraktiviteter og intervention.

Studiet var delt op i tre faser. Først gennemførte vi en behovsidentifikationsfase, hvor nybagte forældre og sundhedsprofessionelle identificerede nybagte forældres behov efter tidlig udskrivelse.
Denne blev efterfulgt af en design, udviklings- og testfase. Her blev en app designet, udviklet og testet mellem hospitalspersonalet og de nybagte forældre derhjemme efter tidlig udskrivelse. Indholdet af app'en var designet på baggrund af de identificerede behov i tæt samarbejde med sygeplejerskerne på barselsgangen og i samarbejde med et team af programmører (Civ.Ing. i Datateknologi.). App'en indeholder en chat funktion, en vidensbase og automatiske tekst beskeder.
App'en blev først pilottestet med 10 familier. Efterfølgende testede vi app'en i en intervention fra marts til oktober 2013, som involverede barselsgangen på OUH, Svendborg og 26 nybagte forældrepar i deres hjem.

Data analysen var inspireret af systematisk tekstkondensering, som udspringer af Giorgi's deskriptive fænomenologiske metode.

Resultaterne fra hele projektet gav en ny forståelse af forældres behov i forbindelse med tidlig udskrivelse efter fødsel og også forslag til en mulig telemedicinsk løsning.
Familierne efterspurgte et individuelt opfølgningstilbud, drypvis information og vejledning og adgang til og nye måder at kommunikere med sundhedsprofessionelle.

På baggrund heraf udviklede vi og testede en app, hvor vi fandt, at sygeplejerskerne havde udfordringer med at passe de nye arbejdsprocedurer ind i deres eksisterende arbejdsrutiner. Imidlertid mente de, at app'en gav dem mulighed for at tilbyde støtte til de familier, som blev udskrevet tidligt, idet app'en gav familierne lettere adgang til drypvis information og støtte, og det forbedrede familiernes mulighed for at tage kontakt til hospitalet efter udskrivelse. Sygeplejerskerne adresserede, at brug af chat forandrede deres måde at kommunikere på med familierne, hvilket de oplevede ændrede deres støtte til de nybagte forældre.
Forældrene var fortrolige med at bruge app'en. De oplevede ikke nogle barrierer i at kontakte sygeplejerskerne ved brug af asynkron kommunikation. Forældrene modtog drypvis information og støtte ved at kommunikere online og de oplevede at deres opfølgningsbehov blev mødt.

App'en blev oplevet som en livline som forbandt forældrenes hjem med hospitalet. App'ens funktionalitet, som inkluderede en chat, en vidensbase og de automatiske beskeder, mødte forældrenes behov, som efterspurgte adgang til sundhedsvæsenet, så de kunne få svar på deres bekymringer, tvivl og spørgsmål i barselsperioden. App'en har potentiale til at sikre tryghed og fremme handlekraft.
Det kan konkluderes at brugen af en app er en måde at støtte nybagte forældre som bliver udskrevet tidligt efter fødslen. Det er dog vigtigt at understrege, at en af de afgørende faktorer i forhold til, at forældre føler sig trygge, er forældrenes oplevelse af at have kontrol over situationen, hvilket understreger vigtigheden af, at forældrene er involveret i beslutningen om, hvornår de skal udskrives.
App'en kunne anvendes i dagligdagen på barselsgangen, men der var udfordringer forbundet med ændringer i arbejdsprocedurerne, og disse skulle løses før den kunne implementeres.

Dette studie giver ny indsigt i forældres behov efter tidlig udskrivelse og i nye måder at organisere tidlig udskrivelse. Det viser, at telemedicin kan have værdi både fra et forældre og sundhedsprofessionelt perspektiv, når det er designet til at møde forældrenes behov med deltagelse af brugerne i design processen.

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Appendix A

Interview guides utilised in the study. Danish version.

Appendix A1

Guideline til feltstudie hos nybagte familier, der har født ambulant

Seks områder bliver retningsanvisende for mine observationer:

Fysiske genstande Enkelthandlinger Hændelserne Tid Hensigt Følelser

I forhold til at komme hele vejen rundt om de seks områder rettes opmærksomheden mod rummet, hjemmet som helhed, det, der sker, det som deltagerne gør og udtrykker både non verbalt og verbalt, stemningen hos deltagerne, hører det som bliver sagt.

Derudover er opmærksomheden rettet mod babyen – hvor er babyen, hos mor, hos far, i vugge for sig selv.

Opmærksomhed rettes mod eventuelle søskende.

Jeg har fokus på alle tilgængelige data, som vil belyse problemstillingen om ambulant fødsel.

Fokusområder, som jeg vil spørge ind til og have opmærksomheden rettet mod om

Tryghed

Trivsel

Handlekraft

Ammeetablering

Pleje af den nyfødte

Familiedannelse

Pleje af sig selv

Jeg vil spørge ind til de enkelte fokusområder.

Derudover vil jeg spørge om:

Hvordan har det været at komme hjem tidligt?

Hvilke udfordringer, hvis nogen, har der været?

Hvad har været let/svært?

Hvad har været det værste/det bedste?

Hvordan har I håndteret at få svar på eventuelle spørgsmål? Hvad ville I gøre anderledes?

Appendix A2

Interviewguide til fokusgruppeinterview med sundhedsprofessionelle. Fase 1.

Indledning og velkomst (10 min).

Velkommen. Mit navn er Dorthe Boe Danbjørg og jeg er ph.d. studerende. Jeg arbejder med projektet 'Telemedicin – en mulighed for kvinder, der føder ambulant?'.

I er blevet bedt om at komme i dag for at være med til at diskutere hvilke behov, I oplever, at de nybagte familier har de første syv dage, samt hvordan I oplever jeres muligheder for at informere og vejlede familierne for at imødese deres behov.

Inden vi går i gang skal I underskrive en informeret samtykke erklæring i forhold til jeres deltagelse i projektet. I skriver under på, at I deltager frivilligt i projektet, at I giver os lov til at optage og udskrive det I siger. Alt hvad I siger, vil blive behandlet med fortrolighed og I er sikret anonymitet. Måske I selv, og nogle af de andre fra gruppen her, vil kunne genkende en gengivelse eller et citat, men jeg anonymiserer det, så det ikke er tydeligt for andre, hvem der har sagt det.

Ydermere er det meget vigtigt at understrege, at I skal opfatte det her som et frit sted, hvor I kan være helt ærlige, også hvis I er kritiske.
Jeg tænker også at vi skal sørge for at holde det der bliver sagt i det her rum for os selv i gruppen, selvfølgelig er hele formålet, at det skal viderеformidles, så vi kan bruge den viden der kommer frem i dag konstruktivt i arbejdet med udvikling af vores praksis, men det kan vi jo også, uden at det direkte fremgår, hvem der har sagt hvad. Grunden til at jeg understreger det ret så meget, er at det er vigtigt for mig, at I føler, at I kan tale helt frit.

Et fokusgruppeinterview er ikke som et almindeligt interview. Det skal faktisk fungere som en diskussion. Jeg stiller nogle spørgsmål, som I så skal drøfte og diskutere med hinanden – altså I skal opføre jer ligesom det var en 'almindelig' diskussion, hvor man lytter til hinanden, lader hinanden tale ud og forholder jer til det hinanden siger. I må også meget gerne underbygge det I siger, så det kommer frem hvorfor I synes, som I gør.

Jeg deltager ikke i diskussionen, men kan godt bryde ind, hvis der er noget af det I siger, jeg gerne vil have uddybet eller hvis diskussionen er ved at gå i stå.

Jeg har en observatør med. Det er Jane. Hun tager noter undervejs og er med til at holde styr på tiden. Og måske hun også kunne finde på at stille et spørgsmål eller to.

Der er tre temaer som I skal diskutere:

1. Hvad oplever I, at de nybagte familier har brug for i den første uge? (20 min)
2. Hvordan oplever I jeres muligheder for at imødekomme de behov, som de nybagte familier har? (20 min)
3. Hvordan oplever I de forandringer der har været indenfor barselsområdet? (10 min)

Udover de tre områder, så slutter vi af med en øvelse, som handler om 'Den perfekte barselsperiode'.

Jeg optager det hele på bånd.

TÆND BÅNDOPTAGEREN

Opvarmningsrunde (10 min)
Vi starter med en præsentationsrunde, hvor I fortæller jeres fornavn, hvad I er uddannet, hvor I arbejder og hvor længe I har arbejdet indenfor området.

Selve fokusgruppeinterviewet

Tema 10 (20 min)
Det første spørgsmål. Som I skal diskutere er:

Hvad oplever I, at de nybagte familier har brug for i den første uge?

Først vil jeg bede jer bruge et par minutter til at skrive nogle stikord ned.

Nu må I gerne starte med at diskutere.

Hjælpespørgsmål:

Hvad er det typisk at de nybagte familier spørger om
Hvad er det af praktiske opgaver, som I hjælper med
Er det mest spørgsmål og information i relation til moderen eller barnet eller familiedannelsen som de har
Oplever I, at familierne søger viden og information andre steder end hos jer, de sundhedsprofessionelle

Hvad spørger de om til:

- 24 timers samtalen...
- Når de ringer ind...
- Når de kommer ind...
- Når de kommer til trivselsbesøget...
- Når de er kommet hjem – første sundhedsplejerskebesøg
- Når de kommer i PBH...
- Når de er indlagt...
- Når de genindlægges...

Tema 2 (20 min)

Det næste spørgsmål I skal diskutere er:

Hvordan oplever I jeres muligheder for at imødekomme de behov, som de nybagte familier har?

Hvis I igen skriver nogle stikord inden I starter diskussionen.

Er der en der vil starte med at sige noget?

Hjælpespørgsmål:
- Hvordan oplever I jeres muligheder for at informere dem i henhold til SSTs anbefalinger?
- Hvad vægter du i informationen af de nybagte familier?

Hvordan fungerer de eksisterende tilbud – fødselsforberedelse, forældresamtalen, telefonsamtalen efter 24 timer, sundhedsplejersketilbuddet, trivselsbesøget, muligheden for at ringe ind… (Vi siger, at de bare skal ringe ind. Hvad tænker I, hvis jeg siger, at de ikke synes, at de kan tillade sig at ringe ind?)
- Ved interview med de nybagte familier fortæller de, at de for at få svar på spørgsmål bruger google – jeg vil gerne høre hvad I tænker om det?
- Hvordan er mulighederne for at yde en individuel barselspleje?

Tema 3 (20 min)

Det næste spørgsmål som I skal diskutere er:

Hvordan oplever I de forandringer der har været indenfor barselsområdet?

Lidt baggrund:
Barselsperioden har ændret sig radikalt de senere år, fra indlæggelse til ambulant fødsel. Fra besøg i hjemmet, til ambulant konsultation på sygehuset. Fra sundhedspleje i hjemmet, til sundhedscentre i kommunen. Fra et tilbud om hjemmebesøg efter ambulant fødsel til en telefonsamtale.
Sundhedsstyrelsen understreger, at de nybagte familier trods forkortet indlæggelsestid og øget forekomst af ambulante fødsler, fortsat har brug for et *sundhedsfagligt tilbud*, der garanterer: 'at den observation og understøttelse af mor og barn, der tidligere fandt sted under indlæggelse, fortsat sikres efter ambulant fødsel eller tidlig udskrivelse' (1, s.36).

Så hvis I kan fortælle lidt om hvordan I som personale oplever den forandring?

Igen, hvis I starter med at skrive et par stikord inden vi går i gang.

Hjælpespørgsmål:

- Føler du som personale at du har haft mulighed for at påvirke de forandringer der er sket?
- Hvordan ser du de forandringer I forhold til det vi diskuterede tidl, altså hvordan mener I, at jeres muligheder er for at imødese deres behov?
- Hvordan harmonerer forandringerne med SSTs anbefalinger?
- Alt i alt har forandringen så været positiv eller negativ?
- Det er ikke kun forandringer i forhold til længden af indlæggelse, hyppigheden af JDM eller SHP besøg, der er ændret, men der har også været en kvalitetsdiskussion qua DDKM – hvordan ser I den forandring DDKM har medført? Mere kvalitet? Mere individuel pleje? Mere standardiseret?
- I jeres hverdag, tænker I så over de forandringer der er sket, som noget der har indflydelse på jeres arbejde?

ØVELSE (20 min):

Øvelse: Nu har vi drøftet hvad I oplever, at de nybagte familier har brug for og jeres muligheder for at imødese deres behov, samt vi har drøftet de forandringer, der har været de senere år indenfor barselsområdet. Nu er det tid til en øvelse.

Sundhedsstyrelsen skriver følgende om barselsperioden:
'De væsentligste elementer i barselsperioden er familiedannelse, moderens fysiske og psykiske restitution, etablering af amning eller anden ernæring samt spædbarnspleje' (1, s. 171). Citer lidt mere fra SST.

Så for at binde en sløjfe og få fremhævet det som I som personale ser som 'Den perfekte barselsperiode' skal vi nu lave en øvelse, hvor I skal bruge lidt tid på at skrive hvad I ser som det vigtigste i barselsperioden og med et par ord beskrive hvad der skal til for at det kan opnås. Altså 'Den perfekte barselsperiode' – hvis det her var virkelighed, så ville familierne opnå tryghed, trivsel og handlekraft eller i hvert fald så ville betingelserne være helt i top. Der har været mange diskussioner i forhold til den seneste fødeplan i regionen. Der har været mange diskussioner på landsplan i forhold til genindlæggelser, den tidl sundhedsminister var ude efter regionerne for ikke at leve op til anbefalingerne fra SST. KL har været ude at sige, at de ukomplicerede forløb skal flyttes til sundhedsplejen, fremfor som nu på sygehuset. Andre har fremhævet, at de nybagte familier burde have muligheden for at forblive indlagt, fremfor at gå hjem ambulant.
På vores egen afdeling har vi valgt at udvikle et tilbud indenfor de politiske og økonomiske rammer. Men lad os antage, at der ikke var nogen begrænsninger. Hvis vi leger med den tanke et øjeblik, kunne jeg godt tænke mig at høre hvad I vil fremhæve som 'Den perfekte barselsperiode'.

Så hvis I skriver lidt ned. Og herefter skal I fortælle lidt om jeres sedler og så skal I se om I kan udlede noget alment fra jeres sedler, altså er der sammenfald i forhold til det I har beskrevet.

Afslutning

Så er vi færdige med selve interviewet. Det har været rigtig berigende at høre jer fortælle om jeres oplevelser.

I løbet af den næste måned har jeg også fået afholdt en workshop med nogle nybagte familier, og I vil blive informeret om hvad vi kan udlede af både workshoppen i dag og den vi skal holde med familierne.
Vi håber, at vi kommer til at ses igen til en ny workshop, hvor vi går videre med resultaterne fra de her to workshops.

Afslutningsvis vil jeg gerne høre hvordan det har været at deltage i dag.

Appendix A3

Interviewguide til fokusgruppeinterview med nybagte familier.

Indledning og velkomst (10 min).

Velkommen. Mit navn er Dorthe Boe Danbjørg og jeg er ph.d. studerende. Jeg arbejder med projektet 'Telemedicin – en mulighed for kvinder, der føder ambulant?'.

I er blevet bedt om at komme i dag for at være med til at diskutere hvilke behov, I som nybagte familier har haft de første syv dage, samt hvordan I har oplevet jeres muligheder for at få den information og vejledning, som I har haft brug for.

Inden vi går i gang skal I underskrive en informeret samtykke erklæring i forhold til jeres deltagelse i projektet. I skriver under på, at I deltager frivilligt i projektet, at I giver os lov til at optage og udskrive det I siger. Alt hvad I siger, vil blive behandlet med fortrolighed og I er sikret anonymitet. Måske I selv, og nogle af de andre fra gruppen her, vil kunne genkende en gengivelse eller et citat, men jeg anonymiserer det, så det ikke er tydeligt for andre, hvem der har sagt det.

Ydermere er det meget vigtigt at understrege, at I skal opfatte det her som et frit sted, hvor I kan være helt ærlige, også hvis I er kritiske.
Jeg tænker også at vi skal sørge for at holde det der bliver sagt i det her rum for os selv i gruppen, selvfølgelig er hele formålet, at det skal videreformidles, så vi kan bruge den viden der kommer frem i dag konstruktivt i arbejdet med udvikling af vores praksis, men det kan vi jo også, uden at det direkte fremgår, hvem der har sagt hvad. Grunden til at jeg understreger det ret så meget, er at det er vigtigt for mig, at I føler, at I kan tale helt frit.

Et fokusgruppeinterview er ikke som et almindeligt interview. Det skal faktisk fungere som en diskussion. Jeg stiller nogle spørgsmål, som I så skal drøfte og diskutere med hinanden – altså I skal opføre jer ligesom det var en 'almindelig' diskussion, hvor man lytter til hinanden, lader hinanden tale ud og forholder jer til det hinanden siger. I må også meget gerne underbygge det I siger, så det kommer frem hvorfor I synes, som I gør.

Jeg deltager ikke i diskussionen, men kan godt bryde ind, hvis der er noget af det I siger, jeg gerne vil have uddybet eller hvis diskussionen er ved at gå i stå.

Jeg har en observatør med. Det er Jane. Hun tager noter undervejs og er med til at holde styr på tiden. Og måske hun også kunne finde på at stille et spørgsmål eller to.

Der er tre temaer som I skal diskutere:

4. Hvad oplever I som nybagt familie at have haft brug for i den første uge? (20 min)
5. Hvordan oplever I jeres muligheder for at få imødekommet de behov, som I har haft? (20 min)
6. Hvordan oplever I en række udtalelser fra sundhedsprofessionelle (10 min)

Udover de tre områder, så slutter vi af med en øvelse, som handler om 'Den perfekte barselsperiode'.

Jeg optager det hele på bånd.

TÆND BÅNDOPTAGEREN

Opvarmningsrunde (10 min)
Vi starter med en præsentationsrunde, hvor I fortæller jeres fornavn, hvad I er uddannet, hvor I arbejder og hvor længe I har arbejdet indenfor området.

Selve fokusgruppeinterviewet

Tema 10 (20 min)
Det første spørgsmål. Som I skal diskutere er:

Hvad oplever, at I som nybagte familier har brug for i den første uge?

Først vil jeg bede jer bruge et par minutter til at skrive nogle stikord ned.

Nu må I gerne starte med at diskutere.

Hjælpespørgsmål:

Hvad er det typisk at I som nybagte familier spørger om
Hvad er det af praktiske opgaver, som I har brug for hjælp med
Er det mest spørgsmål og information i relation til moderen eller barnet eller familiedannelsen som I har

Tema 2 (20 min)

Det næste spørgsmål I skal diskutere er:

Hvordan oplever I jeres muligheder for at få imødekommet de behov, som I som nybagte familier har?

Hvis I igen skriver nogle stikord inden I starter diskussionen.

Er der en der vil starte med at sige noget?

Hjælpespørgsmål:
  • Hvordan oplever I jeres muligheder for at blive informeret?
  • Hvad synes I er vigtigt at blive informeret om?
Hvordan fungerer de eksisterende tilbud – fødselsforberedelse, forældresamtalen, telefonsamtalen efter 24 timer, sundhedsplejersketilbuddet, trivselsbesøget, muligheden for at ringe ind…
Hvordan er mulighederne for at få en individuel barselspleje i den første uge?

Tema 3 (20 min)

Det næste tema som vi skal drøfte er mere en slags 'påstande' – ting, som er fremhævet af sundhedsprofessionelle, som de mener, at I som familier har brug for.
Kendt personale

Det er vigtigt, at personalet er tilgængeligt

De generelle udfordringer siges at være amning, søvn, gråd og afføring

Barriere for at kontakte personalet på barselsgangen telefonisk

I søger information på nettet vha google

Information: For meget generel information, for lidt specifik

Manglende information om normale/unormale situationer

Lang tid mellem udskrivning fra sygehus og til første besøg af sundhedsplejerske (i nogle kommuner)

Manglende kendskab til sundhedsplejersken og hvilken rolle hun spiller

De mange tilbud gør at I føler jer inkompetente og I har svært ved at sige nej, for hvad nu hvis man gik glip af noget

- **Det at der kommer en nyfødt påvirker en families hverdag – alt kommer den første tid til at handle om den nyfødte.**
- **Familierne er glade for at være kommet tidligt hjem, men har brug for opfølgning og for at vide, hvor de kan henvende sig.**
- **Familierne er glade for at kunne være sammen som familie.**
- **Familierne udtrykker ambivalens – de er glade for at være hjemme, men savner stadig tæt vejledning.**
- **Familierne oplever, at det er ok at køre hen på sygehuset, trods afstand, men synes også, at det kræver noget energi at komme af sted.**
- **Familierne er i tvivl om mange ting, særligt ting relateret til spædbarnsplejen.**
- **Familierne bruger deres private netværk til hjælp og råd, hvilket måske kan være problematisk i forhold til at få ukorrekt viden.**
- **Familierne ringer ikke 'bare' ind på afdelingen, trods afdelingen signalerer, at de bare skal ringe ind. De giver den begrundelse, at de nødigt vil forstyrre, de 'burde' måske vide det de er i tvivl om (enten fået det at vide tidligere/eller medgivet info i en pjece).**
- **Familierne bruger teknologien**

ØVELSE (20 min):

Øvelse: Nu har vi drøftet hvad I oplever som nybagt familie at have haft brug for og jeres muligheder for at få imødeset jeres behov, samt vi har drøftet en lang række andre områder. Nu er det tid til en øvelse.

Sundhedsstyrelsen skriver følgende om barselsperioden:
'De væsentligste elementer i barselsperioden er familiedannelse, moderens fysiske og psykiske restitution, etablering af amning eller anden ernæring samt spædbarnspleje' (1, s. 171). Citer lidt mere fra SST. Omformuler evt.

Så for at binde en sløjfe og få fremhævet det som I ser som 'Den perfekte barselsperiode' skal vi nu lave en øvelse, hvor I skal bruge lidt tid på at skrive hvad I ser som det vigtigste i barselsperioden og med et par ord beskrive hvad I mener, at der skal til for at det kan opnås. Altså 'Den perfekte barselsperiode' – hvis det her var virkelighed, så ville I som nybagte familier opnå tryghed, trivsel og handlekraft eller i hvert fald så ville betingelserne være helt i top.
Der har været mange diskussioner i forhold til den seneste fødeplan i regionen. Der har været mange diskussioner på landsplan i forhold til genindlæggelser, den tidl sundhedsminister var ude efter regionerne for ikke at leve op til anbefalingerne fra SST. KL har været ude at sige, at

de ukomplicerede forløb skal flyttes til sundhedsplejen, fremfor som nu på sygehuset. Andre har fremhævet, at de nybagte familier burde have muligheden for at forblive indlagt, fremfor at gå hjem ambulant.

På vores egen afdeling har vi valgt at udvikle et tilbud indenfor de politiske og økonomiske rammer. Men lad os antage, at der ikke var nogen begrænsninger. Hvis vi leger med den tanke et øjeblik, kunne jeg godt tænke mig at høre hvad I vil fremhæve som 'Den perfekte barselsperiode'.

Så hvis I skriver lidt ned. Og herefter skal I fortælle lidt om jeres sedler og så skal I se om I kan udlede noget alment fra jeres sedler, altså er der sammenfald i forhold til det I har beskrevet.

Afslutning

Så er vi færdige med selve interviewet. Det har været rigtig berigende at høre jer fortælle om jeres oplevelser.

I løbet af den næste måned har jeg også fået afholdt en workshop med nogle nybagte familier, og I vil blive informeret om hvad vi kan udlede af både workshoppen i dag og den vi skal holde med familierne.

Vi håber, at vi kommer til at ses igen til en ny workshop, hvor vi går videre med resultaterne fra de her to workshops.

Afslutningsvis vil jeg gerne høre hvordan det har været at deltage i dag.

Appendix A4

Interview guide pilottest - forældre

Teknik:
Har I kendskab til tablets eller smartphones i forvejen? Internetvaner? Hvad har I i forvejen af devices?

Hvordan har app'en fungeret?

Hvordan var den at 'finde ud af'?

Fik I nok instruktion på hospitalet til at kunne bruge den?

Hvordan fungerede internettet? 3G eller wifi?

At bruge en app:

Hvordan har I brugt 'mig og min baby'?

Hvordan var det et skulle bruge en tablet som nybagt forælder?

Har det givet mening at have en app?

Hvad syntes I om:

Alt om:
Søgefunktion? Fungerede den?
Artiklerne? (læste I dem eller brugte I de traditionelle pjecer?)
Videoer?
Manglede I noget?

Meddelelser:

Automatiske meddelelser? (indhold, links, antal, tid (fire dage)
Muligheden for at sende billeder og video?
Muligheden for at skrive ind? Kontra det at ringe?
Hvad med svartid?
Hvordan var det at skulle formulere sig skriftligt og få svar skriftligt?

Hjælp, støtte og tryghed:

Har app'en været en hjælp i forhold til at få hjælp og få svar på spørgsmål?

Har I brugt netværk?

Internet?

Gav det jer tryghed at I havde den?

Følte I at personalet var tilgængeligt?

Hvordan var det at kommunikere på den her måde?

Og til sidst opsummerende, kan du sige lidt overordnet om:

Hvordan har det været at blive udskrevet ambulant?

Følte I jer trygge ved at komme hjem ambulant?

Hvordan har det været med at tage sig af babyen? Og dig selv efter fødslen?

Har I og den lille haft det godt?

Appendix A5

Spørgsmål/emner jeg ønsker familierne at svare på

Fortæl lidt om dig selv/jer:

Hjælpe stikord: antal børn, jeres tidl. Erfaringer, første fødsel (hvis flere børn), graviditeten (kontroller, fødselsforberedelse etc.), fødslen, tiden lige efter fødslen, hvor lang tid blev I på hospitalet. Hvordan var det at være på hospitalet (ville I gerne hurtigt hjem, fik I vejledning/information mens I var der), hvilke tilbud benyttede I jer af den første uge (hospital, egen læge, vagtlæge, sundhedspl), hvornår kom sundhedsplejersken første gang.

Hvordan bruger I teknologi i jeres hverdag?

Hjælpespørgsmål

Har I kendskab til Tablets eller Smartphones i forvejen? Hvad har I af computer, ipad eller smartphone?

Internetvaner? Hvor hyppigt? Og hvad bruger I det til? Brugt det i forhold til graviditet?

Hvordan var app'en at 'finde ud af'?

Fik I nok instruktion på hospitalet til at kunne bruge den?

Hvordan fungerede internettet? 3G eller wifi?

Hvordan var det et skulle bruge en tablet som nybagt forælder?

Hjælpespørgsmål
Hvordan har I brugt app'en?

Har I kunne bruge den i forhold til tvivlsspørgsmål?

Har jeres brug af app'en gjort, at I ikke ringede på hospitalet? Ikke behøvede køre ind til tjek?

Kunne I bruge den i forhold til fx amning? (Fortæl lidt uddybende om hvordan har I oplevet at få hjælp til etableringen af amning? Hvad har hjulpet jer (hjælp på sygehus, app, nettet, netværk, ringe ind, videoer?)

Kunne I bruge app'en til fx at tage vare på den ny (pusle, badning,
Hudpleje etc.) (Fortæl lidt uddybende hvordan har det været med at skulle tage vare på den lille ny? Hvor har I fået hjælp til det?

Kunne I bruge app'en til spørgsmål relateret til dig (moderen). Har I været i tvivl om noget i forhold til blødning, smerter, hvor meget må man løfte, genoptræning eller andet?

Hvad syntes I om:

Alt om:
Søgefunktion? Fungerede den?
Artiklerne? (læste I dem eller brugte I de traditionelle pjecer?)
Videoer?
Manglede I noget?

Meddelelser:

Automatiske meddelelser? (indhold, links, antal, tid (fire dage)
Muligheden for at sende billeder og video?
Muligheden for at skrive ind? Kontra det at ringe?
Hvad med svartid?
Hvordan var det at skulle formulere sig skriftligt og få svar skriftligt?

Hvordan har I oplevet jeres kontakt til personalet?

Hjælpespørgsmål:
Følte I at personalet var tilgængeligt?

Hvordan har det været at få fat i dem?

Har I ringet/skrevet ind?

Har app'en været en hjælp i forhold til at få hjælp og få svar på spørgsmål?

Kan I fortælle om I har spurgt andre til råds, altså fx jeres familie/venner?

Har I brugt Internet? Hvis ja hvilke sider? Google? Min Mave?

Fortæl om den information I har fået (generel, individuel, relevant)

Hvordan var det at kommunikere på den her måde? (skriftlighed, tvivl om entydighed i beskeder)

Har I undladt at kontakte sygehuset hvor I faktisk har været i tvivl om noget?
Nogle fortæller, at de oplever en barriere i forhold til at kontakte sygehuset efter udskrivelse, hvordan oplever I det? Er der i den sammenhæng forskel på at ringe eller skrive?

Kunne brug af app'en erstatte noget i jeres barselsperiode, (evt. Foldere, trivselsbesøg?)

Kan I fortælle om den information og vejledning I har fået?

Hjælpespørgsmål
Hvad har I kunne bruge?

Hvordan har det været?

Fødselsforberedelse?

Jdm. Konsultation?
Fødegang/barselsgang?

Beskeder hver 12. Time?

Hvordan har det været at blive udskrevet ambulant?

Blev I forberedt på det gennem graviditet, hørt om andre der har født ambulant, hvordan havde du selv forestillet dig det?

Tanker og forestillinger omkring det at føde ambulant?

Hvordan vurderer du tidspunktet for udskrivelse i forhold til dit eget ønske?

Hvordan har I oplevet jeres mulighed for at have indflydelse på jeres forløb?

Hjælpespørgsmål
Kan I fortælle hvad der har været med til at gøre at I har kunne træffe beslutninger? Eller handle selv, eksempelvis noget i forhold til enten plejen af den lille eller af dig (moderen).

Hvordan har I oplevet at blive mødt?

Hjælpespørgsmål
Har I oplevet det som et individuelt tilbud?

Synes I at der har været en klar plan for jeres barselsperiode?

I tilfælde af at I har haft nogle spørgsmål, har I så vidst hvor I skulle henvende her?

Har I haft kontrol over situationen?

Hvordan har du oplevet din partner? Har I været fælles om det at have fået den lille?

Kan du fortælle om at have fået den lille, det at familien er blevet større. (enten fra to til tre eller fra tre til fire etc.)

Hjælpespørgsmål
Har I haft mulighed for at være sammen alle sammen?

Har I begge haft barsel?

Hvis I har større børn, hvordan har de reagereret?

Har I begge to taget jer af den lille?

Hvordan har det været at skulle lære den lille at kende?

Interviewguide til fokusgruppeinterview med sygeplejersker

Indledning og velkomst (10 min).

For at starte hvor det hele begyndte, så var det indførelsen af den ambulant fødsel, der er årsagen til, at vi sidder her. Derfor kommer det til at fylde en del af interviewet på lige fod med hvordan I så faktisk har oplevet at bruge telemedicin og hvordan det har fungeret i praksis.

Det bliver en kombination af, at jeg gerne vil høre hvad I synes, samt hvordan I ser, at det kunne være bedre. For vi ved jo alle, at der har været udfordringer. I skal ikke tænke på om I kritisere, fordi det er faktisk en del af processen, hvis vi skal kunne videreudvikle på 'Mig & min baby'.

Helt formelt, er der lige lidt vi skal have på plads:

Inden vi går i gang skal I underskrive en informeret samtykke erklæring i forhold til jeres deltagelse i projektet. I skriver under på, at I deltager frivilligt i projektet, at I giver os lov til at optage og udskrive det I siger. Alt hvad I siger, vil blive behandlet med fortrolighed og I er sikret anonymitet. Måske I selv, og nogle af de andre fra gruppen her, vil kunne genkende en gengivelse eller et citat, men jeg anonymiserer det, så det ikke er tydeligt for andre, hvem der har sagt det.

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Jeg tænker også at vi skal sørge for at holde det der bliver sagt i det her rum for os selv i gruppen, selvfølgelig er hele formålet, at det skal videreformidles, så vi kan bruge den viden der kommer frem i dag konstruktivt i arbejdet med udvikling af vores praksis, men det kan vi jo også, uden at det direkte fremgår, hvem der har sagt hvad. Grunden til at jeg understreger det ret så meget, er at det er vigtigt for mig, at I føler, at I kan tale helt frit.

Et fokusgruppeinterview er ikke som et almindeligt interview. Det skal faktisk fungere som en diskussion. Jeg stiller nogle spørgsmål, som I så skal drøfte og diskutere med hinanden – altså I skal opføre jer ligesom det var en 'almindelig' diskussion, hvor man lytter til hinanden, lader hinanden tale ud og forholder jer til det hinanden siger. I må også meget gerne underbygge det I siger, så det kommer frem hvorfor I synes, som I gør.

Jeg deltager ikke i diskussionen, men kan godt bryde ind, hvis der er noget af det I siger, jeg gerne vil have uddybet eller hvis diskussionen er ved at gå i stå.

Jeg har en observatør med. Det er Maria. Hun tager noter undervejs og er med for at jeg har en at diskutere med efterfølgende. Måske hun også kunne finde på at stille et spørgsmål eller to.

Der er to temaer som I skal diskutere:

1. Hvordan oplever I jeres mulighed for at yde sygepleje efter, at ambulant fødsel er indført?
2. Hvordan har det været at arbejde med telemedicin?

Jeg optager det hele på bånd.

TÆND BÅNDOPTAGEREN

Selve fokusgruppeinterviewet

Tema 1 (25 min)
Det første spørgsmål. Som I skal diskutere er:

Hvordan oplever I jeres mulighed for at yde sygepleje efter, at ambulant fødsel er indført?
Først vil jeg bede jer bruge et par minutter til at skrive nogle stikord ned.

Nu må I gerne starte med at diskutere.

Hjælpespørgsmål:

- Hvordan fungerer de nye tilbud – fødselsforberedelse, forældresamtalen, telefonsamtalen efter 24 timer, sundhedsplejersketilbuddet, trivselsbesøget, muligheden for at ringe ind, APP...
- Hvordan oplever I at have haft indflydelse på de tilbud, som er tilgængelige for familierne?
- Kan I komme I tanke om noget som I synes er enten bedre/dårligere end før ændringerne med den nye fødeplan?

Tema 2 (25 min)

Det næste spørgsmål I skal diskutere er:

Hvordan har det været at arbejde med telemedicin?

Hvis I igen skriver nogle stikord inden I starter diskussionen.

Er der en der vil starte med at sige noget?

Hjælpespørgsmål:

- Hvordan har det været at skulle inkludere familierne?
- Hvordan har det været at skulle til at tjekke computeren for meddelelser?
- Hvordan har det været at skulle kommunikere skriftligt med familierne fremfor face to face eller telefonisk kontakt?
- Har I oplevet andre former for henvendelser efter indførelsen af skriftlige kommunikation – eller er det det same de spørger om, bare på skrift?
- Har I oplevet om der er færre telefonopkald eller modsat flere henvendelser som følge af et her?
- Oplever I, at det har givet nogle nye muligheder?
- Hvad tænker I om de forskellige funktioner? Automatiske beskeder? Information på app i stedet for pjecer? Muligheden for at udveksle tekst, billeder og video?

Afslutning

Så er vi færdige med interviewet. Det har været rigtig berigende at høre jer fortælle om jeres oplevelser.

I løbet af den næste måned vil jeg sammen med Bergliot finde ud af hvordan vi kan mødes, hvor I kan høre mere detaljeret om resultaterne af interviewene, samt hvor vi i fællesskab kan finde ud af hvordan vi kan bruge jeres input og videreudvikle på 'Mig & min baby' og finde ud af, om vi skal fortsætte med den her på afdelingen.

Afslutningsvis vil jeg gerne høre hvordan det har været at deltage i dag.

Appendix B

Literature searches I-IV

Literature search I

A literature search was conducted in PubMed in April 2011 with the following search words
Early postpartum discharge.
Early postnatal discharge
Short postpartum hospital stay
Reduced post partum length of stay
Short postnatal hospital stay.

Limits: English, published within the last ten years.
Pubmed (n=380)
91 after reading headlines
77 after reading abstract
43 after reading full text.

The search was repeated in Cinahl, with no additional relevant hits.

Literature II

A literature search concerning telemedicine and early discharge was conducted with the following search words
Early postpartum discharge AND telemedicine AND e-health.

2 hits were retrieved. Both relevant.

Literature III

The first literature search was broad, and we wanted to focus solely on the new parents' experiences in relation to early discharge, why a new systematic search was conducted with the focus on parents' experiences.

Figure 1: Search strategy with example of the qualitative filter

Postnatal	AND	Early discharge	AND	Qualitative filters applied in PubMed (Faber, 2014)
postpartum postnatal puerperium perinatal postpartum care postnatal care perinatal care breast feeding newborn infant		discharge discharged early reduced short shortened ambulatory outpatient		((("semi-structured"[TIAB] OR semistructured[TIAB] OR unstructured[TIAB] OR informal[TIAB] OR "in-depth"[TIAB] OR indepth[TIAB] OR "face-to-face"[TIAB] OR structured[TIAB] OR guide[TIAB] OR guides[TIAB]) AND (interview*[TIAB] OR discussion*[TIAB] OR questionnaire*[TIAB])) OR ("focus group"[TIAB] OR "focus groups"[TIAB] OR qualitative[TIAB] OR ethnograph*[TIAB] OR fieldwork[TIAB] OR "field work"[TIAB] OR "key informant"[TIAB])) OR "interviews as topic"[Mesh] OR "focus groups"[Mesh] OR narration[Mesh] OR qualitative research[Mesh] OR "personal narratives as topic"[Mesh]

```
┌─────────────────────────────────────┐
│ Litterature search                   │
│ CINAHL (n=2087), Embase( n=5366),    │
│ PsycInfo (n=1038), Pubmed (n=1940),  │
│ Scopus (n=4750), SweMed+(n=3)        │
└─────────────────────────────────────┘
                │
┌─────────────────────────────────────┐
│         Merge databases              │
│         15.184 articles              │          ┌──────────────────────────┐
└─────────────────────────────────────┘          │  4.754 doublets cancelled │
                │  ───────────────────────────────▶│                          │
                │                                  └──────────────────────────┘
┌─────────────────────────────────────┐
│         10.430 articles              │          ┌──────────────────────────────┐
└─────────────────────────────────────┘          │ 10.316 articles excluded due to │
                │  ───────────────────────────────▶│ inclusion criteria (title level)│
                │                                  └──────────────────────────────┘
┌─────────────────────────────────────┐
│          114 articles                │          ┌──────────────────────────────┐
└─────────────────────────────────────┘          │ 91 excluded due to inclusion     │
                │  ───────────────────────────────▶│ criteria (abstract level)        │
                │                                  └──────────────────────────────┘
┌─────────────────────────────────────┐
│          23 articles                 │          ┌──────────────────────────────┐
└─────────────────────────────────────┘          │ 13 excluded due to inclusion     │
                │  ───────────────────────────────▶│ criteria (full text level)       │
                │                                  └──────────────────────────────┘
┌─────────────────────────────────────┐
│          10 articles                 │
└─────────────────────────────────────┘
```

Search and selection process.

For further details see article V.

Literature search IV

A systematic literature search concerning telemedicine and early postnatal discharge was conducted in January 2014. A block strategy was used.

Postpartum	Telemedicine
(postpartum OR postnatal OR Puerperium OR Perinatal OR postpartum care OR postnatal care OR perinatal care OR breast feeding OR newborn OR infant OR childbirth)	(Remote consultation OR tele consultation OR videoconference OR video-conference OR video conferencing OR videoconferencing OR tele conference OR tele conferencing OR tele-conference OR tele-conferencing OR telecommunications OR tele-communication OR telecommunications OR tele-communications OR telemedicine OR tele medicine OR tele-medicine OR telemedical OR tele-medical OR telehealth OR tele-health OR telecare OR tele care OR tele-care OR ehealth OR e-health OR remote care OR remote caring OR hospital at home OR Teleconsultation OR teleconsultations OR cellular phone OR medical informatics applications OR cellular phone, OR software OR computers, handheld)

Results from the literature search

Cinahl (n= 3165) Embase (n=3911) PsycInfo (n=2) Pubmed (n=11.001)

18.079 after merging databases

17.798 after duplicates removed

162 articles after reading title
57 articles after reading abstract
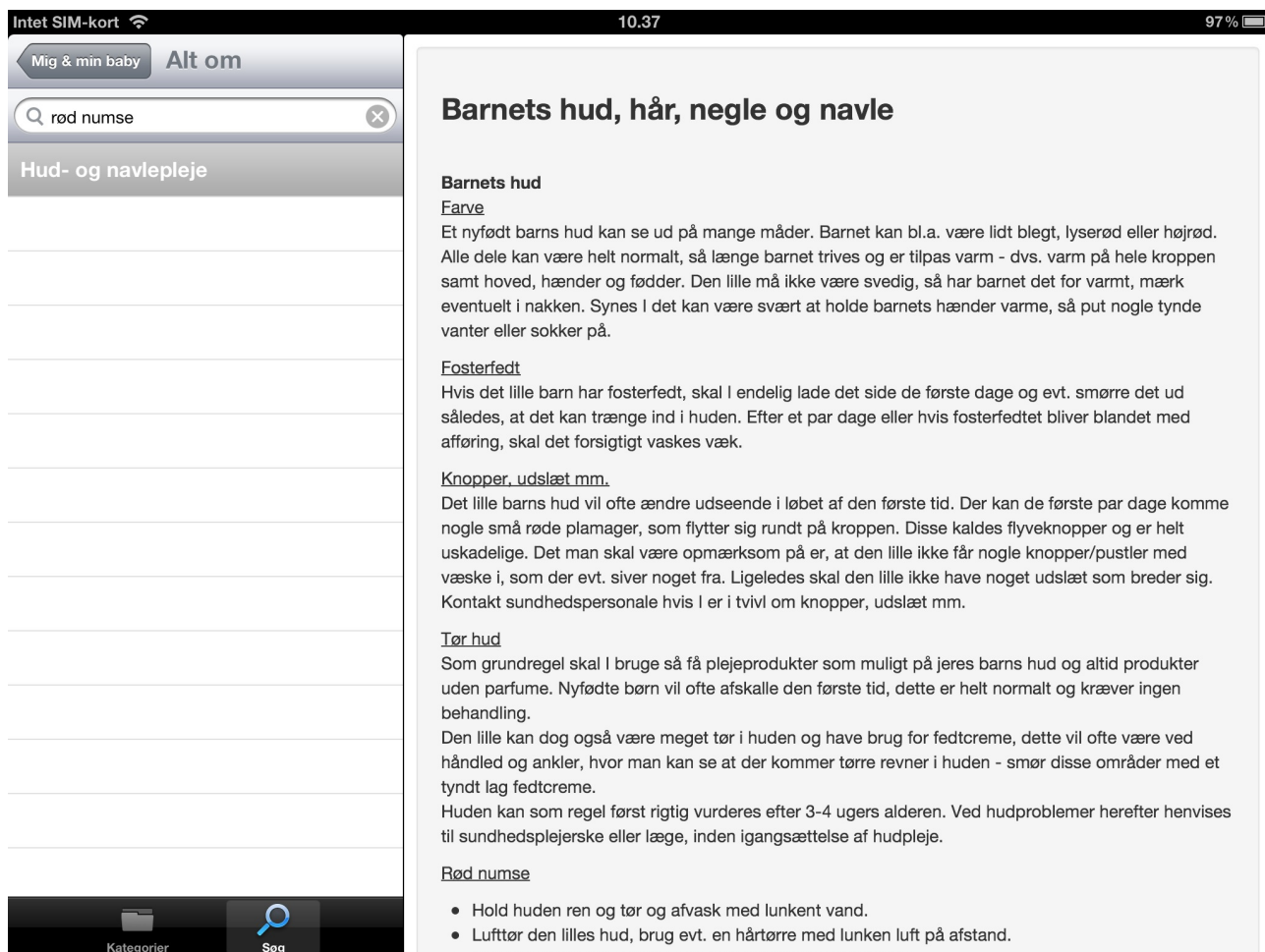4 articles after reading full text

Appendix C

The app.

The knowledgebase, showing the different categories.

Mig & min baby   **Alt om**

🔍 rød numse   ⊗

Hud- og navlepleje

Barnets hud, hår, negle og navle

Barnets hud
Farve
Et nyfødt barns hud kan se ud på mange måder. Barnet kan bl.a. være lidt blegt, lyserød eller højrød. Alle dele kan være helt normalt, så længe barnet trives og er tilpas varm - dvs. varm på hele kroppen samt hoved, hænder og fødder. Den lille må ikke være svedig, så har barnet det for varmt, mærk eventuelt i nakken. Synes I det kan være svært at holde barnets hænder varme, så put nogle tynde vanter eller sokker på.

Fosterfedt
Hvis det lille barn har fosterfedt, skal I endelig lade det side de første dage og evt. smørre det ud således, at det kan trænge ind i huden. Efter et par dage eller hvis fosterfedtet bliver blandet med afføring, skal det forsigtigt vaskes væk.

Knopper, udslæt mm.
Det lille barns hud vil ofte ændre udseende i løbet af den første tid. Der kan de første par dage komme nogle små røde plamager, som flytter sig rundt på kroppen. Disse kaldes flyveknopper og er helt uskadelige. Det man skal være opmærksom på er, at den lille ikke får nogle knopper/pustler med væske i, som der evt. siver noget fra. Ligeledes skal den lille ikke have noget udslæt som breder sig. Kontakt sundhedspersonale hvis I er i tvivl om knopper, udslæt mm.

Tør hud
Som grundregel skal I bruge så få plejeprodukter som muligt på jeres barns hud og altid produkter uden parfume. Nyfødte børn vil ofte afskalle den første tid, dette er helt normalt og kræver ingen behandling.
Den lille kan dog også være meget tør i huden og have brug for fedtcreme, dette vil ofte være ved håndled og ankler, hvor man kan se at der kommer tørre revner i huden - smør disse områder med et tyndt lag fedtcreme.
Huden kan som regel først rigtig vurderes efter 3-4 ugers alderen. Ved hudproblemer herefter henvises til sundhedsplejerske eller læge, inden igangsættelse af hudpleje.

Rød numse
- Hold huden ren og tør og afvask med lunkent vand.
- Lufttør den lilles hud, brug evt. en hårtørre med lunken luft på afstand.

Kategorier   Søg

Alt om **Amning/flaske/udmalk…**

Flaskeernæring

Udmalkning

Kom godt fra start

Mælken løber til

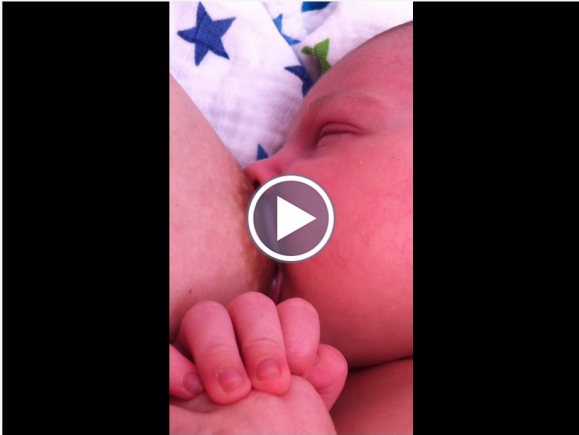**Ammestillinger**

Ammeproblemer

Forhøjet BMI > 27

Ammestillinger

De første måneder efter fødslen bruger du som mor mange timer på amning. Det er vigtigt at kende til flere forskellige ammestillinger, så moderen kan sidde behageligt og afslappet og barnet sutter bedst muligt.

- Klassisk ammestilling: barnets hoved er liggende på moderens underarm, barnets mave er vendt mod moderens mave
- Krydsstilling: moderen har barnets hoved hvilende i hendes hånd, barnets mave er vendt mod moderens mave.
- Tvillingestilling: barnets krop og ben ligger bag ud under moderens arm og hovedet støttes af moderens hånd
- Liggende: barnet ligger på madrassen langs moderens krop, barnets mave er vendt mod moderens mave.
- Laid back: Moderen er tilbagelænet og barnet ligger ind over moderens krop mave mod mave

Det kan være en ide at veksle mellem disse stillinger, især hvis moderen har tendens til mælkestase, tilstopet mælkegange eller brystbetændelse. Barnet får således tømt forskellige områder af brystet. Udtømning af mælk er mest effektiv der hvor barnets hage er.

Information about different breastfeeding positions.

Alt om   **Videoer**

Hud mod Hud

Amning

Flaskeernæring

Barnets trivsel

Barnets signaler

Bad af barn

Amning

Det er vigtigt for både dig og dit barn at amningen kommer godt igang. Se denne video og/eller læs her for mere information: Kom godt fra start

A video about breastfeeding.

Appendix D

Deltagerinformation om deltagelse i et videnskabeligt projekt

Formål med projektet

Du inviteres hermed til at deltage i projektet 'Telemedicin – en mulighed for kvinder der føder ambulant'.

Telemedicin betyder, at en sundhedsydelse kan leveres over afstand vha. teknologi.

Teknologien giver mulighed for tæt kommunikation mellem sundhedspersonale på hospitalet og patienter, selvom de er udskrevet og er derhjemme.

Det vil sige at man som patient kan være derhjemme og få en konsultation med en læge eller en sygeplejerske vha. for eksempel videokonference - hjemmet bliver forbundet direkte med hospitalet via internettet.

Det vil sige, at patienten og sygeplejersken ser hinanden og taler sammen – ligesom skype. Tanken er, at det skal erstatte et ambulant besøg på hospitalet. Den umiddelbare fordel er, at man undgår at skulle ind på hospitalet og dermed også undgår ventetid. Ligeledes vil der være nemmere og bedre adgang til sundhedsprofessionelle, når man som patient har behov for det.

Der er også andre telemedicinske muligheder end videokonference. Det kan også være kommunikation gennem billeder, informationsmateriale og email mm.

Formålet med vores projekt er at udvikle et telemedicinsk tilbud specifikt for barselsperioden som imødekommer de behov som en nybagt familie må have i denne periode. Tilbudet skal gerne være et alternativ til de nuværende tilbud, hvor man ikke længere er indlagt i barselsperioden.

Som det er nu, kan man som nybagt familie, hvis man får behov for vejledning eller er i tvivl om noget med den nyfødte, henvende sig på en barselsklinik i de første syv døgn efter fødslen.

Tanken er at vi vil erstatte det besøg på barselsklinikken med et telemedicinsk tilbud, sådan at man som nybagt familie kan blive derhjemme, men stadig få vejledningen, måske igennem videokonference.

Men for at vi kan blive klogere på, hvad man som nybagt familie har brug for de første syv døgn, vil vi gerne have lov til at komme hjem til jer et par timer og tale med dig og din familie om hvordan det er at komme hjem tidligt efter en fødsel. Hvad har I oplevet af udfordringer ved at blive tidligt udskrevet? Er der noget I har manglet? Og hvad har gjort at I har været utrygge eller trygge ved at komme hjem hurtigt efter fødslen?

Rettigheder

Før du beslutter, om du vil deltage i projektet, skal du fuldt ud forstå, hvad det går ud på, og hvorfor vi gennemfører projektet. Vi vil derfor bede dig om at læse denne deltagerinformation grundigt.

Hvis du beslutter dig for at deltage, vil vi bede dig om at underskrive en samtykkeerklæring.

Husk, at du har ret til betænkningstid, før du beslutter, om du vil underskrive samtykkeerklæringen.

Det er frivilligt at deltage. Du kan når som helst og uden at give en grund trække dit samtykke tilbage. Det vil ikke få konsekvenser for den nuværende/fremtidige pleje og behandling af dig og dit barn.

Plan for projektet
Kort efter din fødsel vil vi spørge dig om du vil deltage i projektet. Du får mundtlig og skriftlig information om projektet, så du er i stand til at tage stilling til, om du ønsker at deltage.

Hvis du ønsker at deltage, underskriver du samtykkeerklæringen og skriver dit telefonnummer, hvorefter du vil blive kontaktet af projektsygeplejerske Dorthe Boe Danbjørg. Dorthe vil komme på besøg hjemme hos dig for at høre, hvordan det er at være kommet hjem tidligere. Barnets far er også velkommen til at deltage i samtalen, som forventes at vare et par timer.

Nytte ved projektet
Vi håber at kunne udvikle et telemedicinsk barselstilbud i barselsperioden. Projektet vil få betydning for, hvilke opfølgningstilbud vi fremover kan give til kvinder, der har født ambulant.

Hvis du vil vide mere om projektet nu eller senere, er du meget velkommen til at kontakte Dorthe Boe Danbjørg på dorthe.boe.danbjoerg@ouh.regionsyddanmark.dk eller 2620 2186.

Med venlig hilsen
Gynækologisk Obstetrisk afdeling D
OUH Svendborg Sygehus

Dorthe Boe Danbjørg   Jane Lyngsø
sygeplejerske, cand.cur   ledende overlæge

Oplysninger om økonomiske forhold
Det er barselsafsnit D2, Gynækologisk Obstetrisk afdeling D, OUH Svendborg Sygehus, der har taget initiativ til projektet.

Adgang til resultater

Projektet strækker sig over en tre årig periode, og der vil løbende bliver offentliggjort resultater. Det forventes, at projektet vil blive omtalt i medierne, sygepleje- og lægefaglige faglige tidsskrifter og præsenteret på konferencer. Data opbevares efter foreskrifter fra Datatilsynet, og dine data vil blive anonymiseret ved offentliggørelse af forsøgets resultater.

Vi håber, at du med denne information har fået tilstrækkeligt indblik i, hvad det vil sige at deltage i projektet, og at du føler dig rustet til at tage beslutningen om din eventuelle deltagelse.

DELTAGERINFORMATION OM PROJEKT „MIG & MIN BABY"

DELTAGERINFORMATION
- om deltagelse i et videnskabeligt projekt

Du inviteres hermed til at deltage i projektet „Mig & min baby".

Lidt om projektet
Kvinder, der bliver tidligt udskrevet efter fødsel, får nu mulighed for at afprøve en app (applikation) „Mig & min baby", som gerne skulle sikre, at kvinderne kan få den nødvendige vejledning og støtte i den første tid med deres nye baby.
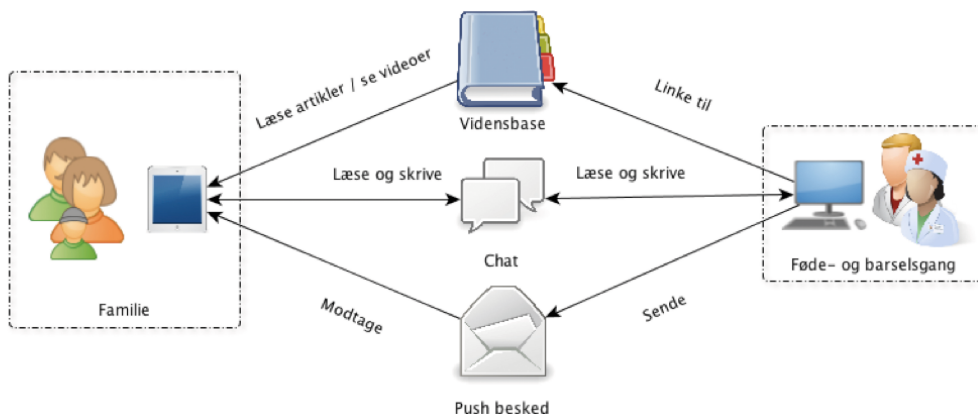
Hvad kan applikationen hjælpe dig med?

Du kan søge i en vidensbase med informationsmateriale og vejledningsvideoer, som er udarbejdet af fagprofessionelle.

Du kan chatte døgnet rundt med barselssygeplejersker. Du kan også sende billeder og videooptagelser af din baby.

Du får løbende tilsendt meddelelser og information, der er tilpasset din babys alder.

Vil du være med?
Vi vil gerne invitere dig til at afprøve app'en. Hvis du siger ja til at deltage, vil du få en iPad udleveret fra sygehuset, hvor app'en er installeret.

Vigtigt, før du siger ja

Chatten vil blive tjekket af barselssygeplejerskerne hver fjerde time. Hvis du har spørgsmål af akut karakter, skal du ringe direkte til afdelingen.

IPaden skal betragtes som et lån i de første syv dage efter fødslen. Der er indbygget GPS (global position system) i iPaden, som betyder, at den kan spores i tilfælde af, at den bliver stjålet. Muligheden for at lokalisere iPaden vil kun blive brugt, såfremt den bliver stjålet eller ikke returneret.

Du vil have iPaden med hjemme i syv dage, hvorefter du skal returnere den til sygehuset i en frankeret svarkuvert og speciel transport æske, som du får udleveret sammen med iPaden fra sygehuset, inden du går hjem.

Du skal vide, at du ikke kan downloade andre app's til iPaden.

Efterfølgende vil vi gerne høre om dine oplevelser med at bruge en app i barselsperioden. Vi vil derfor gerne interviewe dig. Det forventes at tage ca. 30 minutter.

Lidt om baggrunden for projektet

Indlæggelsestiden efter fødsel er reduceret og det almindelige er nu, at kvinder udskrives indenfor de første 24 timer efter fødslen.

Projektets formål er at undersøge, om vi ved hjælp af teknologi kan sikre, at de kvinder kan få vejledning og støtte efter de er udskrevet.

Tankerne bag projektet er udsprunget af begrebet „telemedicin", som betyder behandling over afstand ved hjælp af teknologi. F.eks. kan patienterne hjemmefra være i tæt kontakt med de sundhedsprofessionelle vha. videotelefon eller online chat og på den måde få vejledning.

På baggrund af interviews med sundhedsprofessionelle, nybagte mødre og fædre har vi identificeret hvilke behov familier har i perioden lige efter fødslen. Herefter har vi afholdt workshops, hvor mulige telemedicinske løsninger er blevet testet. Gennem et samarbejde med en IT virksomhed har vi nu fået udviklet app'en „Mig & min baby".

Adgang til resultater

Projektet strækker sig over en treårig periode og der vil løbende bliver offentliggjort resultater. Det forventes, at projektet vil blive omtalt i medierne, sygepleje- og lægefaglige faglige tidsskrifter og præsenteret på konferencer.

Data opbevares efter forskrifter fra datatilsynet, og dine data vil blive anonymiseret ved offentliggørelse af forsøgets resultater.

Rettigheder

Før du beslutter, om du vil deltage i projektet, skal du fuldt ud forstå, hvad det går ud på, og hvorfor vi gennemfører projektet. Vi vil derfor bede dig om at læse denne deltagerinformation grundigt.
Hvis du beslutter dig for at deltage, vil vi bede dig om at underskrive en samtykkeerklæring.

Husk, at du har ret til betænkningstid, før du beslutter, om du vil underskrive samtykke-erklæringen. Det er frivilligt at deltage. Du kan når som helst og uden at give en grund trække dit samtykke tilbage. Det vil ikke få konsekvenser for den nuværende/fremtidige pleje og behandling af dig og dit barn.

Nytte ved projektet

Vi håber at kunne videreudvikle barselstilbuddet, så det imødekommer de behov, man som nybagt familie har i barselsperioden. Projektet vil få betydning for, hvilke opfølgningstilbud vi fremover kan give til kvinder, der har født ambulant.

Vi håber, at du med denne information har fået tilstrækkeligt indblik i, hvad det vil sige at deltage i projektet og at du føler dig rustet til at tage beslutningen om din eventuelle deltagelse.

Hvis du vil vide mere om projektet nu eller senere, er du meget velkommen til at kontakte Dorthe Boe Danbjørg på :
dorthe.boe.danbjoerg@ouh.regionsyddanmark.dk
eller 2620 2186.

Med venlig hilsen
Dorthe Boe Danbjørg, sygeplejerske, ph.d.-studerende
Gynækologisk Obstetrisk afdeling D
OUH Svendborg Sygehus

Oplysninger om økonomiske forhold

Projektet er finansieret af Novo Nordisk Fonden, Region Syddanmark og Syddansk Universitet.

Det er barselsafdelingen, OUH, Svendborg Sygehus, der har taget initiativ til projektet.
Projektet gennemføres som et ph.d.-projekt ved Enheden for Sygeplejeforskning, Syddansk Universitet under vejledning af Hovedvejleder: Lis Wagner, Professor, Dr. PH, RN., Enheden for Sygeplejeforskning, Syddansk Universitet.
Projektvejleder: Jane Clemensen, ph.d., cand. cur., RN., Enheden for Sygeplejeforskning, Syddansk Universitet.
App'en er udviklet i samarbejde med MedWare.

Appendix E

Informeret samtykke

Samtykkeerklæring vedrørende projektet: Telemedicin – en mulighed for kvinder der har født ambulant.

Jeg ved, at min deltagelse i projektet indebærer, at jeg vil få besøg derhjemme af en sygeplejerske, som vil snakke med mig om min oplevelse ved at have født ambulant.

Jeg bekræfter hermed, at jeg, efter at have modtaget såvel skriftlig som mundtlig information, indvilger i at deltage i det beskrevne projekt.

Jeg er informeret om, at det er frivilligt at deltage, og at jeg når som helst og uden begrundelse kan trække mit tilsagn om deltagelse tilbage, uden at det vil påvirke den nuværende/fremtidige pleje og behandling af mig og mit barn'.

Dato	Navn (blokbogstaver)	Underskrift (deltager)

Telefon:

Dato	Navn (blokbogstaver)	Underskrift (informerende sundhedspersonale)

Appendix F

Sygeplejerske, cand. cur.
Dorthe Boe Danbjørg
OUH, Svendborg Sygehus
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21. december 2011

Projekt-ID: S-20110171
CKH/csf

Forskningsprojekt: Telemedicin - en mulighed for kvinder der føder ambulant.

Den Videnskabsetiske Komité for Region Syddanmark har på sit møde den 13. december 2011 behandlet ovennævnte forskningsprojekt.

Afgørelse

Komitéen besluttede, at projektet ikke er anmeldepligtigt til det videnskabsetiske komitésystem, jf. komitélovens § 8, stk. 1, idet der er tale om et kvalitetsudviklingsprojekt.

I Danmark har det videnskabsetiske komitésystem til opgave at vurdere biomedicinske forskningsprojekter. Ved et biomedicinsk forskningsprojekt forstås en virksomhed, der er tilrettelagt efter videnskabelig metode, og som tilsigter at frembringe ny, værdifuld viden om menneskets biologiske og psykologiske processer enten i forhold til raske mennesker eller til at forebygge, erkende lindre, behandle eller helbrede sygdom, sygdomssymptomer og smerter, herunder at påvirke legemsfunktioner.

Biomedicinsk forskning omhandler primært forskning inden for de lægevidenskabelige fag, den kliniske og den socialmedicinsk-epidemiologiske forskning. Begrebet omfatter, udover forskning af de somatiske sygdomme, tillige de psykiatriske og de klinisk-psykologiske sygdomme og tilstandsformer. Herudover inddrages tilsvarende odontologisk og farmaceutisk forskning under begrebet.

Registerforskningsprojekter og spørgeskemaundersøgelser skal kun anmeldes, hvis der indgår menneskeligt biologisk materiale i projektet. For interviewundersøgelser gælder tilsvarende regler, dog med den undtagelse, at hvis formålet er at intervenere gennem interview og samtale, er det anmeldelsespligtigt.

Forsøg på cellelinier eller lignende, der stammer fra et forsøg med indsamling af celler eller væv, som har opnået den nødvendige godkendelse, skal heller ikke anmeldes.

Forsøg, der alene har til formål at fastlægge et kemikaliums toksikologiske grænse i mennesket, er ikke anmeldelsespligtige. Ved et kemikalium forstås i denne forbindelse et stof, der ikke finder terapeutisk anvendelse.

Dit projekt er som nævnt vurderet til at falde uden for denne afgrænsning af projekter, som skal anmeldes til en regional videnskabsetisk komité.

Der ligger således ikke i afvisningen af at bedømme projektet nogen negativ vurdering af projektets indhold.

Klagevejledning:
Komitéens afgørelse kan, jf. komitélovens § 25, stk. 1, indbringes for Den Centrale Videnskabsetiske Komité, senest 30 dage efter afgørelsen er modtaget. Den Centrale Videnskabsetiske Komité kan, af hensyn til sikring af forsøgspersonernes rettigheder, behandle elementer af projektet, som ikke er omfattet af selve klagen.

Klagen samt alle sagens dokumenter sendes til:

<div align="center">

Den Centrale Videnskabsetiske Komité
Finsensvej 15
2000 Frederiksberg

</div>

Klagen kan også sendes elektronisk til: cvk@sum.dk

Følgende komitemedlemmer deltog i mødebehandlingen:
- Birger Møller
- Henrik Steen Hansen
- Jeppe Gram
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- Marie Luise Bisgaard
- Freddie H. Madsen
- Sonny Berthold
- Frede Skaaning

På Komiteens vegne,
venlig hilsen

Birger Møller   /   Claus Kvist Hansen
Formand   Sekretariatsleder

Kopi til: PhD, adjunkt, Jane Clemensen, Syddansk Universitet, Enheden for sygeplejeforskning, Klinisk Institut, Campusvej 55, 5230 Odense M.

Pernille Gynther Mikkelsen

Fra: Pernille Gynther Mikkelsen
Sendt: 8. december 2011 10:41
Til: Dorthe Boe Danbjørg
Emne: SV: Anmeldelse af projekt til Datatilsynet

Kære Dorthe,

Jeg har modtaget din anmeldelse til Datatilsynet af projektet "Tryg med telemedicin – en mulighed til kvinder, der føder ambulant"

Jeg ingen bemærkninger til anmeldelsen og ser derfor ikke noget til hinder for, at projektet igangsættes.

Den formelle kompetence til at godkende projektet ligger hos Region Syddanmark (men jeg er den rette at anmelde til på OUH). Desværre er godkendelsesproceduren ikke på plads i regionen (men der arbejdes på det). Du har ved at anmelde projektet til mig foretaget dig det, som du er pligtig til i henhold til Persondatalovens bestemmelser, og kan anse projektet som godkendt af Datatilsynet.

Projektet kategoriseres som et forskningsprojekt, og falder ind under paraplyanmeldelse nr. 2008-58-0035 "Sundhedsvidenskabelig forskning i Region Syddanmark".

Dit projekt medtages på den næste samlede rapportering til Datatilsynet for Region Syddanmark, som forventes at ske primo 2012.

Har du spørgsmål til ovenstående, er du velkommen til at kontakte mig.

Venlig Hilsen

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Fra: Pernille Gynther Mikkelsen
Sendt: 22. november 2011 10:24
Til: Dorthe Boe Danbjørg
Emne: Anmeldelse af projekt til Datatilsynet

Kære Dorthe,

Jeg har forsøgt, ud fra din lægmandsrapport og projektbeskrivelse, at udfylde vedhæftede skema. Normalt skal du selv udfylde det.

Du bedes læse skemaet igennem, samt udfylde følgende punkter:

- Punkt 3: Har du manuelle registre med i dine undersøgelser – det vil sige i papirform? Derudover skal du tage stilling til om der skal sættes yderligere krydser udover helbredsforhold, samt afsnittet

08-12-2011

om enkeltpersoners private forhold

- Punkt 4 – afsnittet om "Der behandles følgende typer af oplysninger om de ovenfor angivne kategorier af personer" skal du ligeledes udfylde
- Punkt 5: Såfremt du overfører dine data til fx andre projekter, skal du skrive det her
- Punkt 8: Hvornår har du tænkt dig at påbegynde projektet?
- Punkt 9: Hvornår har du tænkt dig at slette dine indsamlede data?
- Og dernæst en underskrift

Når du har udfyldt de ovenstående felter, skal du returnere skemaet til mig, og jeg vil derefter give dig en tilbagemelding på om projektet kan igangsættes.

Har du spørgsmål er du velkommen til at kontakte mig.

Venlig Hilsen

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Godkendelse af anmeldt projekt til Datatilsyney

Det bekræftes hermed, at projektet "Tryg med telemedicin – en mulighed for kvinder, der føder ambulant?." er anmeldt til Datatilsynet via Region Syddanmark og medtages på Region Syddanmarks oversigt for paraplyen 2008-58-0035" Sundhedsvidenskabelig forskning i Region Syddanmark".

Venlig hilsen

Dorte Riskjær Larsen
Jurist

Region Syddanmark

Paper I

Do families after early postnatal discharge need new ways to communicate with the hospital? A feasibilility study

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ARTICLE INFO

ABSTRACT

Objective: the length of the postnatal hospital stay in Denmark as well as globally has been radically reduced over the past 10–20 years and this raises the challenge of finding new ways of providing observation and support to families discharged early, that they otherwise would be provided as inpatients.

Aim: this study is to identify the nursing support needs of new parents and their infants during the first seven days post partum, by drawing on the experiences of all stakeholders' in early postnatal discharge from hospital, and thereby gaining new knowledge to investigate further whether telemedicine is a viable option in providing the required support.

Design: this article describes the first phase of a participatory design process. A qualitative approach guided the research process and the data analysis. Data were collected from participant observation, qualitative interviews with the new parents, focus groups interviews and a workshop attended by the new parents and health-care professionals.

Participants and setting: the total number of participants in this study was 37; nineteen parents and 18 health-care professionals from one hospital and three municipalities in Denmark.

Findings: the investigation findings highlighted, amongst other aspects, the importance of individualised postnatal follow-up in which families have increased access to the health-care professionals and are provided with timely information tailored to their specific needs.

Key conclusions and implications for practice: the present study underscored that the families experiencing early discharge were not provided with seamless individualised follow-up support. They requested more availability from the health-care system to respond to their concerns and questions during the postnatal period. They experienced a barrier in attempting to contact health-care professionals following hospital discharge and they asked for new ways to communicate that would eliminate that barrier and meet their needs for more individualised and timely information and guidance.

Introduction

The length of hospital stay postnatal has declined radically over the past 10–20 years (Brown et al., 2002; Johansson et al., 2010) and raises the question of whether new ways should be investigated to provide observation and support for the early discharged mother and newborn, which they otherwise would receive if in the hospital.

In Denmark, the number of women who are discharged within 48 hours post partum has increased from 20% in 1997 to 33% in 2008 (Poulsen and Brot, 2009) Simultaneously, the number of readmissions of newborns with nutrition related problems within

the first 28 days post partum has doubled (National Institute of Public Health, 2011).

The international literature shows concern of whether there is a direct correlation between early discharges and readmissions of newborns. Reviews from 1995 and 2009 (Braveman et al., 1995; Brown et al., 2002) determined that, on the basis of existing research, it could not be concluded that early postnatal discharges lead to feared consequences such as failed breast feeding, readmissions due to nutrition related problems and/or increased infant mortality and morbidity. It is problematic to draw precise conclusions because existing studies are difficult to compare due to substantial variations in antenatal preparation and in the definition of early discharge and the follow-up offer (Braveman et al., 1995). The definition of early discharge differed between local standard practices in the different studies, with early discharge varying from 12 hours to just under 72 hours.

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Some studies show that new parents experience feelings of insecurity during the postnatal period (Persson and Dykes, 2002; Frederiksson et al., 2003; Persson et al., 2011). A Danish questionnaire study (N=1507 women) identified that a proportion of the women who were discharged early postnatal (within 24 hours) experienced lacking follow-up support, i.e. 44.3% did not receive the support needed to care for the newborn; 37.5% did not receive support for postnatal self-care; and 46.1% did not receive support in breast feeding (Unit of patient perceived quality, 2010). These issues are concurrent with international reporting (Kanotra et al., 2007; Johansson et al., 2010). In 2011, the Region of Southern Denmark developed a new policy regarding the postnatal period and in which early postnatal discharge (i.e. from four to six hours; max. 24 hours) would be the general procedure following uncomplicated delivery for first-time and multiparous mothers. Within 24 hours following discharge, families would receive a telephone call at home from a midwife; this would be followed by a visit to the outpatient clinic 48 hours after discharge when the newborn would have a blood sample drawn and a hearing test administered. During the 4–5 days following delivery, families could visit the outpatient clinic for a check-up and if needed, they would have access to telephone consultations around the clock.

The Danish Health and Medicine Authorities emphasises that new families have an ongoing need for a health professional solution that guarantees:

…the observation and support of the mother and newborn that is otherwise provided during [hospital] admission, continues to be ensured after early postnatal discharge (Poulsen and Brot, 2009)

Hence, the challenge remains to find new ways of offering 'observation and support' after early discharge because of the new early discharge policy in the Region of Southern Denmark. Telemedicine can provide an innovative solution to offering health-care services. We define telemedicine as the delivery of health care and exchange of health-care information across distance, which correspond with the WHO definition: 'The delivery of health-care services, where distance is a critical factor, by health-care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health-care providers, all in the interest of advancing the health of individuals and their communities' (World Health Organization).

This information and advice channel is currently being used in other specialities e.g. diabetes and chronic obstructive pulmonary disease with promising perspectives that diminish readmissions, unnecessary transportation and provide patients with a sense of security at home, while meeting their needs for nursing support following hospital discharge (Clemensen et al., 2005; Hjelm, 2005).

Studies from Sweden and Finland on the use of telemedicine in postnatal discharge have been published. In particular, findings by Lindberg and Salonen show that telemedicine has potential for providing appropriate support (Lindberg et al., 2007, 2009; Salonen et al., 2011).

The aim of the present study is to identify the needs of new parents and their infants for nursing support during the first seven days postnatal, based on parents' experiences with early postnatal discharge, thereby gaining new knowledge that would assist in assessing whether telemedicine is a viable option to ensure the required support and guidance.

Methods

Design

This study utilised a participatory design process derived from Action Research and framed in critical theory (Carr and Kemmis, 1986; Clemensen et al., 2007). Participatory design (PD) was chosen to gain knowledge about the needs of the new families, who were early discharged. PD can provide knowledge and at the same time create new ideas of new ways of handling the needs of the new families, because working with PD there is strong practitioner–researcher collaboration. The practitioners work together with the researchers to find a solution to the practical problem that the new policy created (Reason and Bradbury, 2001; Wagner, 2006).

A qualitative approach guided the research process and the data analysis. The data were collected through participant observation, qualitative interviews, focus groups and a workshop with new parents and health-care professionals.

This article describes the first phase of the study (see Fig. 1). Phase two in the present study (see Fig. 1) will focus on the development of an actual telemedicine solution, based on the ideas generated at the May 2012 workshop and phase three will focus on testing of the solution in a real life setting.

Participants and data collection

Firstly, participant observation (37 hours) was carried out by the first author in the postnatal ward in October 2011 (see Fig. 2). The observation in this study is primarily based on passive participant observation and field notes were taken concurrently in accordance with Spradley's (1980) recommendations. The purpose of the observations was to get a grasp of the problem in the local setting. The observations were primarily used to identify themes for the interview guide, why the findings in this article focus solely on the interviews, focus groups and workshop. The first author observed ten families on their visits in the postnatal clinic; five visits with a midwife 48 hours postnatal and five visits with a nurse on day either four or five postnatal and spend the rest of the time together with the health-care professionals talking about the families' needs postnatal.

Secondly, individual interviews (n=7) (Table 1) with parents discharged from the postnatal ward were conducted by the first author with either one or both parents at home during the period from October to November 2011. The first author checked with the health-care professionals on a regular basis to see if there were any families who met the inclusion criteria, i.e. families discharged early postnatal max. 24 hours after delivery. Exclusion criteria were complicated birth and parents, who did not speak Danish.

Three informants had stayed at the hospital more than 24 hours postnatal but were regarded as discharged early in relation to the medical condition of the mother or the newborn. Thereafter the health-care professionals gained the written consent of the prospective participants to participate in the interview.

Thirdly, focus group interviews (n=3) were conducted. One focus group with the health-care professionals (nurses, health-care visitors, midwives, doctors) (n=12), one focus groups with primiparous parents (n=5) and one focus group with multiparous parents (n=4) in March 2013. The inclusion criteria for new families were comparable with those established for the individual interviews.

Inclusion criterion for the health-care professionals was simply an interest in participating in developing postnatal follow-up care. Multidisciplinary health-care professionals worked at the hospital, with the exception of the health visitors who were drawn from three nearby collaborating municipalities.
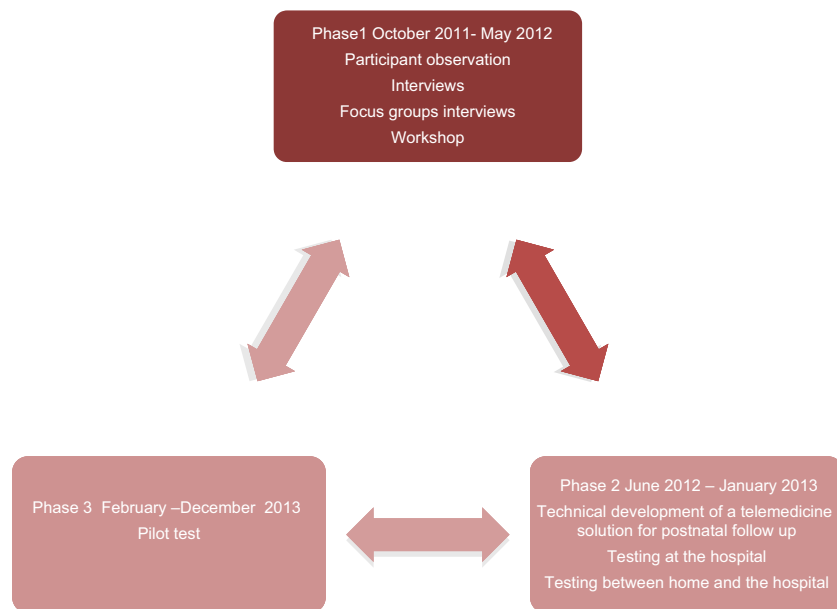
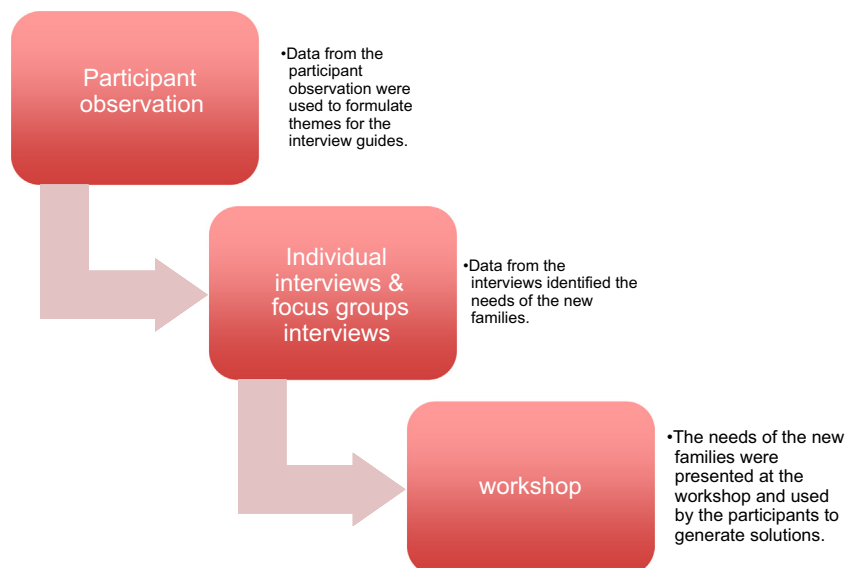**Fig. 1.** An overview of the three phases in the study.

Fig. 2. An overview of the data collection.

Interview guides were compiled according to recommendations by Spradley (1979) and Kvale (1996) for both the individual and the focus group interviews and were used to keep the conversation on track. The interview guides focused on three main themes: (a) informant experiences with guidance and advice provided within the first week postnatal; (b) informant perspectives on support options that would provide them with a sense of security; and (c) informant experiences with early discharge.

The researcher made field notes during the individual interviews that were conducted and took between 35 and 70 minutes. The focus groups took place in a secluded conference room at the hospital (Spradley, 1979) and was facilitated by the first and third authors. The focus group interviews had duration of between 104 and 111 minutes and were tape-recorded and fully transcribed.

A two hour creative workshop (Byrge and Hansen, 2009) was held in May 2012. The individual interviews and the focus group had identified needs for nursing support by the new parents and their infants during the first seven days postnatal. We asked the informants from the focus groups if they would participate in the workshop and those who could did attend while others brought colleagues in addition. In total five nurses, one health-care visitor, three doctors, two midwives, two multiparous mothers and two primiparous mothers attended. The identified needs of the families were presented to trigger and develop ideas for new solutions. The participants were informed that the aim of the study was to assess whether telemedicine could be a solution. The ideas involving telemedicine were discussed to explore the participants' view on this, but the participants were at the same time asked to come forward with all their ideas, so that the technological ideas were not favoured in the idea process. This is according to the philosophy in the participatory design process.

The workshop was conducted on the principles of 'The Creative Platform', i.e. parallel thinking, task focus and non-judgment (Byrge and Hansen, 2009). The creative platform is a mental meeting place where participants from different professions, social and cultural backgrounds can meet and develop new thoughts and

Table 1
An overview of the participants in the seven individual interviews, the three Focus Groups and the workshop.

Participants	Women	Men	
Primiparous parents	7	3	10
Multiparous parents	7	2	9
Health-care professionals*	18		18
Total number of participants	32	5	37

Seven individual interviews were conducted with four multiparous mothers, one multiparous father and three primiparous mothers and primiparous fathers.
Three Focus Group Interviews were conducted: one with four multiparous mothers, one with four first time mothers and one father and one with 12 health-care professionals; one doctor, two health visitors, three midwives and six nurses.
One workshop with two multiparous mothers, two primiparous mothers and 11 health-care professionals: five nurses, one health visitor, three doctors and two midwives. Four of the new parents and five of the health-care professionals from the Focus Groups also participated in the workshop. The parents from the individual interviews were not asked to participate in the workshop, because the workshop was held six months after their participation in the interview and we considered that too much time had passed since they gave birth.
No one refused to participate in the study, but two mothers cancelled the interview appointment because they could not cope with it due to lack of sleep. Two multiparous mothers and two primiparous mothers did not show up for the focus groups.

 * Three midwives working at the hospital. Three medical doctors working at the hospital. Three health visitors working in three different municipalities. 15 nurses working at the hospital.

actions together. Working with these principles stimulates creative thinking for new solutions to existing problems.

 The data and materials comprised demographic details on age, gender, education, nationality, number of children and job situation of the new parents, fields notes from the individual interviews, transcripts of the focus group interviews, video recordings and notes (post-its and flipchart presentations) from the workshop.

Ethical considerations

 The informants received oral and written information about the study and were included after providing their informed consent in compliance with the Helsinki Declaration. The study was submitted to the Scientific Ethics Committee. The committee decided that approval from an ethics committee was unnecessary according to national legislation in Denmark (S-20110171). The Danish Data Agency registered and approved the study (2008-58-0035).

Data analysis

 The data analysis was inspired by Malterud's systematic text condensation (Malterud, 2003) and organised according to steps in the main structure of the analysis, as shown in Table 2. Firstly, we captured an overall impression of the data and extracted superior themes. Secondly, the data was divided into meaningful topics. Finally, the data was analysed/coded with the aim of deducing meaningful topics into categories. As is apparent from the table below, the categories were furthermore divided into subcategories (Table 2). In order to enhance validation, all authors were involved in the process of analysis. Our findings were subsequently discussed in relation to relevant literature.

Findings

 The total number of participants in this study was 37. Nineteen parents, 10 first-time parents (seven women and three men) and nine multiparous parents (seven women and two men), as well as 18 health-care professionals from one hospital and three

municipalities in Denmark, who had between 2 and 20 years of experience in their respective fields. See Table 1.

 The age of the parents ranged from 25 to 45 years. All of the participants lived with their respective partners. The educational level of the participants ranged from vocational education to PhD level and all of them were employed. There was no distinct difference in their experiences and statements related to the socio-demographic variables.

 Following data analysis, three overall categories and ten subcategories were identified. The overall categories are (1) the need for an individual follow-up, (2) the need for availability, and (3) new ways to communicate. The subcategories will be described in the following paragraphs.

The need for an individual follow-up

A feeling of being unwelcome

 The families experienced that early hospital discharge generated pressure on them. Some were left with a feeling of being 'kicked out':

> You are totally hormonal, you have just experienced the greatest thing in your life and then you get the question 'Are you soon ready to be discharged?' – It is like you don't feel welcome; because if they wanted you to stay, [then] they shouldn't ask that question Participant (P) 12, primiparous mother.

 The pressure generated a feeling of insecurity among the new parents. They felt like they did not have the time even to assess whether they were ready to go home. One of the mothers phrased her insecurity towards early discharge as follows:

> Well I thought [that] when they said I'm ready to go home [then] I must be ready. P10, primiparous mother.

Not being met as an individual

 The families experienced that early discharge undermined their individuality; they felt that everyone had to fit into the same box and that it lacked a more personal focus. Some of the families felt that their needs were 'special' and they questioned whether they could expect the health-care system to show consideration for them:

> Although you are multiparous, or given that you are multiparous, you need the peace and quiet with your new baby at the start, [something] that a hospital stay does give you (...) To get to know the little one, just the two of you. It may become even more important that everything goes smoothly with the little one when you also have siblings to take care of (…) But maybe that's just my needs… P 16, multiparous mother.

A need for availability

The use of private networks

 It was clear throughout the analysis that the families, especially the primiparous parents, were dependent on their respective networks of family and friends. They expressed a sense of confidence and praise for their accessibility to both family and friends when and if they needed assistance:

> I called my mother, who else? P11, primiparous mother.

 The health-care professionals indicated a somewhat ambivalent attitude towards the families' use of their private networks. One health visitor expressed the following:

> You experience it when you come as a health visitor to a neighbourhood where they haven't had a health visitor for

Table 2
Process of analysis.

Step 1: From medley to themes: Superior themes extracted	Step 2: From themes to codes. Identifying the meaningful units. The meaningful units are coded.		Overall categories arise from the coding process	Subcategories
	QUOTATIONS	[code]		
Being kicked out	'You do want to go home early, right? I didn't really know what I wanted.'	[Expectation to go home early postnatal, uncertainty of own need]		A feeling of being unwelcome
			The need for individualised follow-up	
More check-up	'We know we have a support base that we can rely on; that helped us'	[Support from family]		Not being met as an individual Security
	'No I wouldn't call the maternity clinic, I would call my mom.'	[Using family instead of health-care professionals]		
A tranquil beginning	'I had expected to get more attention; among other things I would have liked them to check the weight'	[Expectation not met]		The need for available health-care professionals around the clock
Network	'That we can tell them that we are within reach – that we are available; that gives them security when they are discharged.'	[Knowing that they can get help; help available]	A need for availability	Doubts and insecurity
Finds security in family support	'For me it was important to have the opportunity to get to know the little one'	[Individualised need not met]		The use of social network
	'Taking their time, when you feel your problem is just a trifle.'	[Barrier to contacting the health-care professional]	New ways to communicate	Available health-care professionals
Important that it is easy to get help	'I don't think I would call, maybe I would go on the internet and search for an answer.'	[Barrier to contact the health-care professionals – easier to go online]		Barrier to contact the health-care professionals
Disturbing the health-care professionals Internet	'All those folders; when do they think I will have the time to read them?'	[Not optimal way to inform the new families]		Individualised information at the right time
Information				Internet

some years; then there are all these home-spun theories, P20 health visitor.

On the one hand, they found it valuable that families had someone to turn to, but on the other hand it was a challenge for the health-care professionals especially not to appear condescending when informing new parents that some of the advice they had received from their network may be incorrect and not evidence-based. The professionals emphasised that there could be a contradiction, for instance, between the advice given to families by their networks and, for instance, new guidelines on breast feeding, sudden infant death syndrome etc.

The need for available health-care professionals around the clock

The families were explicit that they desired having a health-care professional nearby; this would give them a sense of security. As one father said with a smile:

It would give us a great sense of security if one of the personnel could sleep on our doorstep P 15, primiparous father.

It was just as important for the new parents to be able to seek guidance in the middle of the night, because newborns did not distinguish night from day and, as several of the families stated, they felt most vulnerable during the night.

The new parents felt ambiguous about the opportunity of being at home and having the family together as they also missed having a health-care professional at hand. One mother enjoyed being at home during the day but at night she had the urge to 'check in' at the hospital and have a professional there to answer her questions.

Doubts and insecurity

The parents experienced doubts and questions during the first week postnatal, which left them feeling insecure. Most concerns regarding breast feeding and the well-being of the newborn. It was

mainly the primiparous parents who had questions regarding care of the infant but some of the multiparous parents had also felt insecure. One multiparous mother was slightly panic-struck because she felt that she did not remember anything about infant care. She had two older children but felt insecure even concerning basic care tasks for the newborn. She stated:

I feel insecure because if I don't remember this, and I question what else have I forgotten? P 5, multiparous mother.

New ways to communicate

Barriers

Both the health-care professionals and the families expressed that the families felt averted when trying to contact a health-care professional after discharge. Their experiences with phoning the postnatal ward and their family doctor left them with the impression that it was difficult to get through:

I was on hold for 40 minutes - it could have been preferable to send a mail P 16, multiparous mother.

The families expressed a clear understanding of the business pressures in the health-care system and felt stressed that they might be disturbing the health professionals unnecessarily if they tried to contact them. The professionals confirmed this difficulty when meeting with the families at the outpatient clinic, where questions that should have been raised earlier were finally asked:

Typically, if I ask a family why they haven't contacted us regarding an issue, the answer is that they did not want to disturb or they thought [that] they would just wait until the scheduled appointment at the outpatient clinic, P27, nurse at the postnatal ward.

The option to chat with the health-care professionals was mentioned as an alternative to phone calls. The new parents stated that it would be easier and more convenient and that sending a chat message would be less disturbing.

Individualised and timely information

The health-care professionals reported that since the policy change in favour of early postnatal period came into effect, they had to prepare women already during their pregnancy in order to cope with the postnatal period following early discharge. This meant that families were provided with a great deal of general information:

> They are at the ward for such a short period of time. We do not have time for a lot, so they get just the general information. Well that's not very individualised care P 28, nurse at the postnatal ward.

The challenge appeared to be providing the families with individualised information at the right time. The families also informed that they had received a substantial amount of written information from the hospital that they could not relate to. They desired that the information was 'tailored' and easy to access. They found that it was easier to Google certain words than to read through a pile of pamphlets. At the workshop it was suggested that these pamphlets be replaced by a web-based application that could provide the information they needed by search words or by FAQs (frequently asked questions).

A multiparous father informed that when they were admitted to hospital with their first baby, he relied heavily on the professionals' advice and information. He stated:

> They would come into our room in the morning and we just started talking; you know small talk. But at the same time they informed us about all sorts of things – things we didn't know or had any chance to ask. They would say things like 'today you can expect that the bowel movement will change colour. I miss that kind of informal advice this time because we were discharged early – maybe you could try and create it using a text message service on a daily basis when you are discharged? P2, multiparous father.

This idea was also developed during the workshop. The families should receive tailored information in the form of an e-mail or online chat message, following early discharge.

Use of the Internet

The parents turned to the Internet for help, using the Google search engine. They also accessed different baby related websites and used various baby applications that they had on their smart phones or tablets. The parents explained that they were ambiguous about using these sources because they experienced finding a lot of useless information as well and that they were concerned about the validity of the information they found. One mother phrased it as follows:

> I tried to Google using the key words 'red bottom' but I got a lot of hits that weren't related. It would be a great help if the hospital provided some kind of knowledge base, where you could search for baby related issues P19, multiparous mother.

The idea that the hospital should provide a knowledge base with a search option similar to Google was also developed during the workshop, with a further specification that the knowledge base be linked to a home page or take the form of a separate application.

Discussion

Despite the policy's wording that emphasises that no family should feel that they have been pressured into an early discharge, the reality begs to differ, and as was reported by both the families and the health-care professionals. The families expressed their sense of having to fit into a standardised care framework that provides only general information and little individualised support. The intention of antenatal preparation is to prepare families, to the extent possible, for their brief hospital stay. Yet the families expressed that this preparation had a certain reverse effect: it pressured them to conform to an early discharge. McLachlan et al. (2009) found that women valued staying at the hospital for a certain length of time postnatal, indicating that acknowledgement of individual needs is a priority. Early discharge challenges women's individual needs, a conclusion that correlates with what The Danish Institute for Health Services Research found, i.e. future care in the health-care system will be characterised by an increase in standardisation (Vinge, 2010). In relation to this challenge, it has been identified that patients can experience an asymmetry between their degree of influence and a power related asymmetry manifested by health-care professionals within the practice of fast-track programmes (Norlyk and Harder, 2009). This is reflected in our study, where to some degree the families experience an inability to influence postnatal follow-up support and simultaneously feel apologetic for their own needs (e.g. the need to stay longer in hospital) when these conflict with standardised practices. This can be interpreted as an asymmetry in power, i.e. the rules and regulations of the health-care system take priority over individual needs.

In order to feel secure, families need to know that they can rely on follow-up support after early postnatal discharge. This correlates with other studies that have also shown that a mother's sense of security during the first postnatal week depends on the level of support provided by the staff and knowing where to seek help when needed. Studies show that when new families have the opportunity for follow-up support from health-care professionals, it strengthens their role as parents (Lof et al., 2006; McLachlan et al., 2009; Persson et al., 2011). Previous studies indicate that web-based interventions improve parents' knowledge (Hudson et al., 2003). A quasi-experimental study ($n=1300$ families) by Salonen et al. was conducted to evaluate the effectiveness of a web-based intervention to support mothers and fathers' parenting satisfaction and parenting self-efficacy. The intervention offered, among other things, online support for parenting, breast feeding, expert advice and an information database. Both intervention and control mothers' and fathers' parenting satisfaction and parenting self-efficacy became more positive during the postpartum period. However, no intervention effects were found; yet the authors concluded that online support had the potential to reach parents and pointed to the fact that more interactive interventions needed to be developed to support parents (Salonen et al., 2011). This indicates that the interactive aspect is important to new parents requiring guidance and support. It addresses the request of this study's participants for an option to communicate online and to have access to an information database instead of using Google.

Another option to satisfy the above-mentioned concerns is to establish a telemedicine follow-up support system. A pilot study by Lindberg et.al that involves a maternity department and new parents in their homes, described how parents were able to maintain follow-up contact with the hospital through video conferencing. This indicates that video conferencing may be a useful support tool after early postnatal discharge; it facilitates an

encounter where new parents can be counselled at the start of their parenthood (Lindberg et al., 2007, 2009).

The families in the present study also indicated that it was important for them to be able to contact health-care professionals around the clock. Although that option already exists today, parents reported feeling a barrier to making contact the health-care professionals; they felt like a disturbance to the hospital staff. This concern is concurrent with other studies (Moore and Sherwin, 2004; Bjoernes et al., 2012). A way to overcome this barrier is to facilitate an asynchronous written environment, offered by the Internet (Salonen et al., 2011) because it allows the users to communicate without being present. Bjoernes explored the possibility of online contact between the health-care professionals and men with prostate cancer ($n=34$) who experienced short hospital stays. These patients experienced accessibility to health-care professionals using asynchronous online communication (e-mail). Their need for individualised information was accommodated (Bjoernes et al., 2012).

This is why telemedicine may be a viable solution. Telemedicine holds the promise of improving access to health care and raising quality because it will empower patients by providing more individualised information, treatment and care (Wootton and Hebert, 2001; Broens et al., 2007).

Further research is needed in order to investigate whether telemedicine could be a viable solution after early postnatal discharge. It could be interesting to test different telemedicine solutions e.g. videoconference, app's or internet based solutions to see if they can meet the needs of the new parents.

Study limitations

Working with a participatory design and with the focus on a local change in one ward at one hospital in Denmark leads to a so-called 'local' theory. It could be relevant in other setting, why the study findings may be transferable to other hospitals and developed into a general theory.

This is a small sample, but the sample was heterogeneous as the parents varied in age, education, occupation and came from both rural and urban settings. On top of that the sample also included health-care professionals, which expounded the topic from different perspectives.

There was no distinct difference in experiences and statements from the participants, so the sample size appears to be adequate for the subject studied. The interviews were undertaken two-three weeks following the birth, at this time the experiences of the first seven days were still present, which would strengthen the credibility.

Conclusion

The present study underscores that the families experiencing early discharge were not provided with seamless individualised follow-up support. They requested more availability from the health-care system to respond to their concerns and questions during the postnatal period.

The study emphasises the need for individualised follow-up support by families discharged early postnatal and where accessibility to health-care professionals is ensured. An important finding of the study was that families experienced a barrier when attempting to contact health-care professionals and that they turned for assistance instead to their private networks and the Internet. The study results indicate that it could be possible to meet the follow-up support needs of these families through new ways to communicate such as online communication and evidence based information knowledge bases.

Declaration

All authors have contributed to this article.

Conflict of interest

There are no conflicts of interest.

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Paper II

Designing, Developing, and Testing an App for Parents Being Discharged Early Postnatally

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ABSTRACT

In Denmark and internationally, earlier discharge of postnatal patients presents a challenge to find innovative ways of providing follow-up support to new mothers who may be discharged early. The purpose of this participatory design study is to describe the process of the design, development, and testing of an app as a viable information technology solution. The app was tested with 10 new families. The test results suggest that the new families and the nurses found the app to be viable and the app met the new families' needs for follow-up support. However, the app required refinements and wider testing.

Keywords: app, asynchronous communication, communicating online, postnatal care, telemedicine, timely information, work processes

In Denmark and internationally, there has been a development toward earlier discharge of post-natal patients. In Denmark, the average length of hospitalization postnatal has decreased from 92 hours in 2007 to 77 hours in 2012.[1] In 2011, the Region of Southern Denmark developed a new policy regarding the postnatal period, which stated that early postnatal discharge (ie, from 4-6 hours with a maximum of 24 hours) would be the general practice after an uncomplicated delivery for first-time and multiparous mothers.

Studies have shown that new parents request accessibility from the health care system to respond to their questions during the postnatal period, and when they are discharged early, they experience a lack of follow-up support, have doubts, and feel insecure.[2-5]

This presents a challenge to find innovative ways to provide the support for the early discharged mother and newborn child that they would have received if they remained in the hospital for a longer duration.[6] As shown by Clemensen et al,[7] telemedicine can provide an innovative solution to offering health care services because it offers improved access to information

and improved access to services.[8] Telemedicine involves the delivery of health care and the exchange of health care information across a distance. The World Health Organization defines it as, "The delivery of health-care services, where distance is a critical factor, by healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and pre-vention of disease and injuries, research and evalua-tion, and for the continuing education of health-care providers, all in the interest of advancing the health of individuals and their communities."[9]

Telemedicine has also been developed within obstetrics practice.[10,11] Studies from Sweden and Finland on the use of telemedicine in postnatal early discharge have been published, and, in particular, findings by Lindberg et al[12,13] and Salonen et al[14] show that telemedicine has the potential to provide appropriate support to parents because it makes it possible for new parents to be guided by health care professionals in their transition into parenthood.

There are several terms within the concept of telemedicine including telehealth, eHealth, and

mHealth. We use the term mobile health. "Mobile Health (mHealth) is an area of electronic health (eHealth) and it is the provision of health services and information via mobile technologies such as mobile phones and Personal Digital Assistants (PDAs)."[15]

BACKGROUND

To investigate if mHealth could be a viable solution, we conducted an interview study to identify the needs of new families when the mother was discharged early. The new families requested more access to the health care system; they experienced a barrier in attempting to contact health care professionals after hospital discharge, and they asked for new ways to communicate such as the use of e-mail and texting that would eliminate that barrier and meet their needs for more individualized and timely information and guidance.

This indicates that it could be possible to meet the follow-up support needs of these families by adopting innovative communication methods. The aim of the present article is to describe how we designed, developed, and tested a viable information technology (IT) solution, an app, for new postnatal families discharged early from hospital.

The objectives of this study are to explore to what extent the nurses consider that the IT solution fits into their working routines, families' experience of the IT solution as a response to their follow-up support needs, and the experience of nurses and families in relation to communicating online.

METHODS

Design

This study applied a participatory design (PD) process. PD has its roots in action research[16,17] and combines the use of qualitative techniques and intervention based on in-depth consultation with users. The PD approach involves defining problems and indicating solutions with the aim of designing sustainable solutions for practice. In the current study, the informants participated during the initial exploration and problem definition, both to define their needs after early discharge and to develop ideas for a solution. They also participated in the design and development process and tested proposed

solutions. This article elaborates on the design, development, and test process.

Setting

The study took place on a postnatal ward that handles approximately 1,000 births a year. In total, 16 nurses participated in the design, development, and test process. Their professional experience in postnatal care varied from less than 1 year up to 30 years, with a mean of 10.2 years.

The Design and Development Process

The IT solution designed was an app. The definition of an app is "A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer."[18]

It was designed collaboratively by both health care professionals and new parents, who engaged in a range of activities in order to ensure that the app was designed and developed with relevance for the practitioners (Figure 1). The design of the app was based on the identified needs of the new postnatal mothers who were discharged early and their partners. The identified needs have been reported in-depth previously.[2] In brief, new families requested an individualized postnatal follow-up, timely information and guidance, and accessibility to and new ways to communicate with health care professionals. The content, format, and style of the app were designed on the basis of the identified needs in close cooperation with the nurses on the postnatal ward and with the assistance of a team of computer programmers.

THE APP "ME & MY BABY"

The research team worked with a team of computer programmers to design an app with the following setup and characteristics:

1. Asynchronous communication, where the participants do not communicate concurrently. It was designed as an online e-mail system in which families and the health care professionals can exchange messages, text messages, and photos and videos. This method of communication may diminish the barrier in accessing health care professionals after hospital discharge.

Figure 1. The design, development, and testing process.
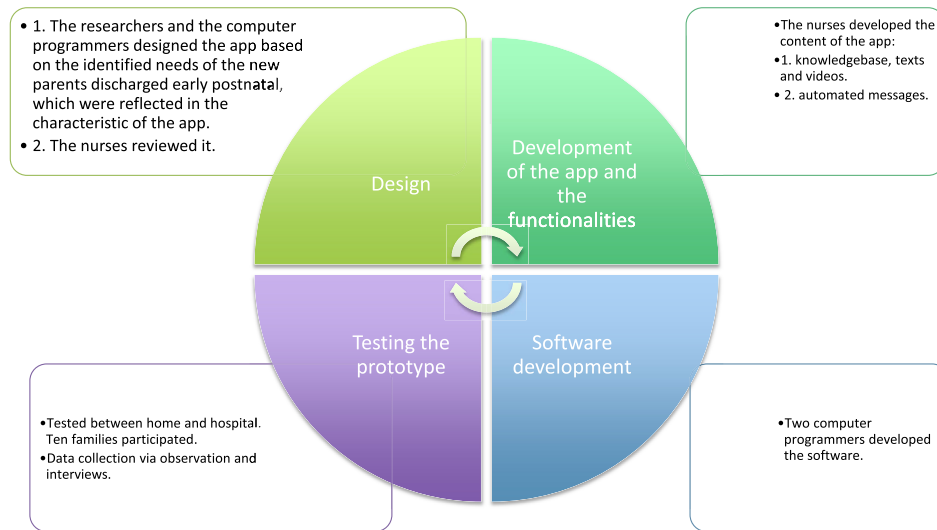
2. A knowledge base consisting of information material (articles and videos) with a search function for easier access to information.

3. Notifications automatically issued every 12 hours from the time of birth, when the family was registered on the system. The messages relate to the age of the baby and should be relevant to the new parents because they provide them with information about breastfeeding, the baby's first bowel movement, and so on (Figure 2).

The nurses on the postnatal ward reviewed the functionality and form of the first version, and the design was then developed further. The 16 nurses were invited to participate in the development process, and 2 nurses were primarily responsible for the development of the content, such as the information (including text and videos) in the knowledge base. Some of the content was adapted from existing information pamphlets and digitized.

The next step was to develop the content for the automated notifications. The nurses wrote down what they would normally inform and instruct the new parents about in the first postnatal days, and it was rewritten into short notifications that the new families would receive every 12th hour for the first 4 days after their baby was born.

The nurses also created instruction videos on the ward. The videos contained guidance on breastfeeding,

bathing, baby cues, and so on. The team of computer programmers developed the software for the app as well as the accompanying Web page where the nurses, among other things, should register the new parents.

PILOT STUDY

Once a prototype had been developed, an internal test was conducted with the researchers and the team of computer programmers. The app was then tested in a pilot study for a period of 2 months (December 2012 to February 2013) with nurses and newly discharged families.

Procedure

Before the pilot test, the nurses were instructed in the use of the app and the accompanying Web site. The nurses registered the new parents on the Web site and used it to check for messages. The nurses were responsible for the online chat, which in practice meant that they had to check it every 4th hour and send a reply to the families. Two of the nurses were responsible for updating the knowledge base. The tasks were on top of the nurses' already assigned duties. No extra time was given in their day for the additional task of answering messages.

Sample and Context

Ten new families were included from the postnatal ward in concordance with the inclusion criteria

Figure 2. Me & my baby.
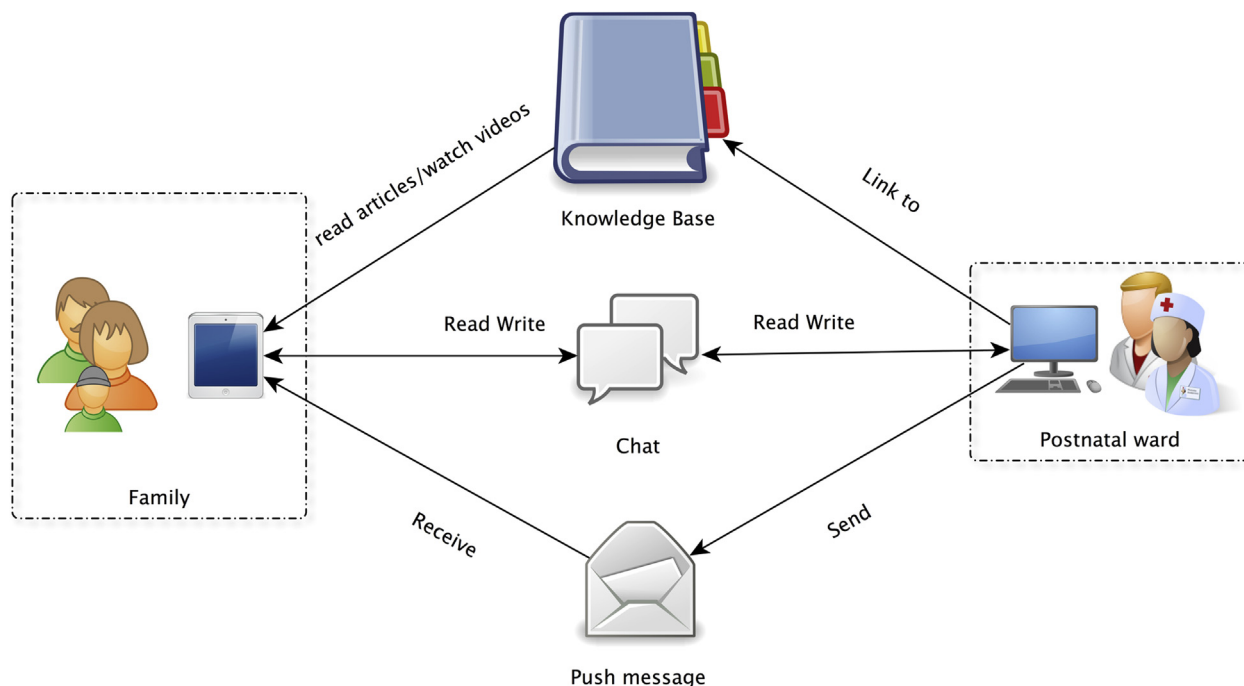
(ie, postnatal mothers discharged early, no later than 24 hours after delivery). It was only adult parents of term healthy parents who were included.

The exclusion criteria were mothers with a complicated birth and those who did not speak Danish. It was both the first author and the nurses on the postnatal ward who included the families. Convenience sampling was applied[19] (ie, the sampling process had to be practicable for the nurses during their busy working day). None of the families declined to participate.

Once agreement to participate was received, the new mother filled out a form on which she provided demographic details. The new parents were allowed to take home an iPad (Apple, Cupertino, CA) on loan on which the app was installed. They had access to the app for 7 days. They had to return the iPad to the hospital with a prestamped envelope after 7 days.

Ethical Considerations

The informants received oral and written information about the study and were included after providing their informed consent in compliance with the Helsinki Declaration. The study was submitted to the Scientific Ethics Committee. The committee decided that approval from an ethics committee was unnecessary according to national legislation in Denmark (S-20110171). The Danish Data Agency registered and approved the study (2008-58-0035).

Data Collection

Participant observation was performed on the postnatal ward for a period of 2 months and for, on average, 14 hours per week. The observation in this study was primarily based on active participant observation and informal conversation with the nurses in which the focus related to the objectives of the study.

Field notes were taken concurrently in accordance with Spradley's recommendations.[20] The observations were active; the first author at the same time helped to inform patients and assist with technical issues.

Subsequently, individual telephone interviews (n = 10) with parents (9 mothers and 1 father) were conducted. Field notes were taking during the interviews. The interviews took between 15 and 25 minutes.

An interview guide was compiled according to recommendations by Spradley[21] and Kvale.[22] The interview guide focused on the following themes: (1) the functionality of the app, (2) the app in relation to their follow-up support needs, and (3) communicating online. The data material comprised demographic details on age, sex, education, nationality, number of children and employment status of the new parents, logging data, and field notes from the individual telephone interviews and the participant observation.

Data Analysis

The data analysis was inspired by Malterud's systematic text condensation[23] and organized according to the steps taken in the analysis, as shown in the Table.

First, we captured an overall impression of the data and extracted main themes. Second, the data were divided into meaningful topics. Finally, the data were analyzed/coded with the aim of deducing meaningful topics into categories. As is apparent from the Table, the categories were further divided into subcategories. In order to optimize validation, all authors were involved in the analysis process. Our findings were subsequently discussed in relation to relevant literature.

Findings

Ten families and 15 nurses participated in the study. The age of the mothers ranged from 21 to 31 years. All of the participants lived with their respective partners. The educational level of the mothers ranged from secondary school to university level. All, apart from one who was in receipt of disability benefits, were employed. There were 4 first-time parents and 6 multiparous parents. There was no distinct

Table. Process of Analysis: Examples From the Analysis

Step 1: From medley to themes: superior themes extracted after the first open reading of the text.	Step 2: From themes to codes. Identifying the meaningful units. The meaningful units are coded based on the superior themes as well as the preunderstanding and the theoretical frame.		Step 3: From codes to meaning. The meaningful units are sorted into groups with respect to the codes; hereby overall categories arise from the coding process, which then are divided into subcategories.
	Quotations	[Code]	
Getting used to new routines	"Even though we talk about it in the beginning of the shift, and I know that I have to check it, I get caught up with other things and I simply forget."	[New work processes]	New working routines:
Forgot			Difficult to change work processes
Stress			Time-consuming
No experience	"I am not familiar with all the technical details."	[Technology is a challenge for the nurses]	Functionality of the app:
Challenging			Lack of technical competences (nurses)
No big deal	"It is quite simple."	(New parents are used to the technology)	Easy to use (parents)
Videos helpful	"It was helpful to see the different breastfeeding positions."	[technology gives new possibilities]	New ways to communicate:
			New possibilities
Secure Write	"It was secure knowing that you could write them any questions."	[written communication adds to security]	Written communication
			New ways to inform

difference in their experiences and statements related to the sociodemographic variables.

The categories that emerged from the data analysis of the observations and the interviews were new working routines, functionality of the app, and new ways to communicate.

New Working Routines. The nurses found the online chat challenging and did not always check the chat every 4 hours. The following excerpt is typical of the participant observation.

I have just sat down for my coffee break on the ward. We drink coffee at around ten o'clock and it is now five minutes past ten. I am sitting in the staff room with the charge nurse and a student. One of the nurses (nurse 4) enters the room. I say "Hi" and she looks at me and says, "The chat! I forgot." And then she runs out. When she returns, she has checked the chat and we laugh about it. I say, "What an effect I have," nurse 4 replies, "Yes, seeing you makes me feel guilty. Even though we talk about it at the beginning of the shift, and I know that I have to check it, I get caught up with other things and I simply forget" (field note, January 2013).

Reasons given for forgetting to check the online chat were that the nurses were too busy and there were challenges to adopt a new unfamiliar routine; the nurses had to go to the office to check the chat, and they usually spend most of their time in the patients' rooms or the nursery room.

As a consequence, they sometimes overlooked a message that had been received. This was not considered to be a problem for the families because only 1 of the interviewed parents experienced the extended waiting time for a response as problematic.

Functionality of the App. The nurses reported that the Web site was easy to use. They had no problems in accessing the site, logging in, registering new patients, and so on. The majority of the nurses did not have that much experience with apps and tablets, and they felt it was a challenge to introduce the families to the app because of their own insecurity.

"I find it very challenging to introduce the families to the app—I am not familiar with all the technical details" (nurse 3, field note, December 2012).

On the contrary, the new parents were, in general, familiar with using apps; most of them had a smartphone or a tablet. They found that the app functioned well and was easy to use, and they did not request more information or guidance on its use.

"It is quite simple and no big deal to use an app" (mother) and "my boyfriend is technical, so it was almost him showing the nurses how it worked" (mother).

Most of the families had a WiFi connection at home, and there the app worked optimally. However, if they were away from home and reliant on 3G, in some locations the mobile 3G Internet access was not strong. This meant that, in some places, PDF files from the knowledge base could not be downloaded and the videos could not be played.

New Ways to Communicate. The use of an app provided new methods of communication. For example, the families liked the option to watch a video showing different breastfeeding positions.

"It was helpful to see the different breastfeeding positions. And the possibility to watch it again if you have any doubts" (mother).

They emphasized that it was an advantage to be able to watch the video again if they wanted to check anything they had seen.

The possibility of sending photos to the hospital provided a new dimension in the exchange of information over a distance and reduced the need for some families to attend the hospital for a checkup.

"I got really useful feedback on the question that I had regarding the umbilicus. And they also noticed that the groin was red—that was really helpful" (mother).

The nurses found that the quality of the photos taken with the iPad camera were good enough to assess (eg, the umbilicus), although the importance of good lighting was underlined.

"The photo was ok, but it depends on the light, as to how easy it is to assess" (nurse 5, field note, January 2013).

The families valued the automatic notifications, and they provided them with individualized and timely information.

"It is difficult to remember everything, when you are told it all before being discharged, so getting them continuously was good—I could have used more of them" (mother).

The parents experienced that it was easy to contact the health care professionals via the app, and they explained that this was why they did not hesitate to contact the nurses if they had any doubts.

"It was reassuring to know that you could write to them and ask any question and then get an answer within a reasonable period of time" (mother).

On the contrary, however, the nurses saw it as a challenge to engage in online chat with the families. They worried that their answers were not clear enough, but at the same time they underlined that it also was a matter of getting used to this new way of communicating.

"Well, it is time consuming, but maybe it is a matter of adjustments to new routines" (nurse 5, field note, February 2013).

DISCUSSION

In this study, we found that the nurses had difficulties fitting the new work processes into their existing working routines. The nurses experienced handling the app as stressful because they felt they did not have the required competencies to introduce the new parents to the app. The families, on the contrary, were confident in using an app, and they reported that it met their needs for postnatal follow-up support. The families found it natural to communicate online, and they did not feel any barriers in contacting the nurses via the app.

In PD, when introducing a new technology, it is important to clarify the participants' relation to the work processes and organizational context.[16] The nurses found it difficult to remember to check if new messages had appeared in the online chat. We tried different approaches; among other things, we wrote the times for checking the chat on a notice board in the office.

None of these approaches had a noticeable impact. The nurses themselves reported that it was a question of adjusting to the new routines, and we decided to evaluate again after a longer and more thorough intervention. This is in agreement with Clemensen et al[24]; we found that the introduction of a clinical trial gives strength to a PD study in which the prototype is tested in a real-life setting because organizational, practical, and technological challenges

are revealed, and it was valuable in order to prepare the nurses for the change.

The app seemed to have potential to provide the families with the follow-up support that they needed. The new families felt reassured because it was easy to contact the health care professionals and they experienced that the nurses were accessible across a distance. This correlates with other studies that have shown that a mother's sense of security during the first postnatal week depends on the level of support provided by the staff and knowing where to seek help when it is needed.[25-27] A study on prenatal care identified the importance of the possibility for women to seek advice when they want it in order for the care visit structure to be patient centered.[28] This correlates with our study in which the new parents valued the opportunity to write messages to the health care professionals around the clock. The families referred to the interactive aspect as "a lifeline," and it fulfilled the role of making their access to the hospital easier.

It was also reassuring for the families to receive the automated messages with the tailored information. Studies show that, when new parents have the opportunity for follow-up support from health care professionals, their role as parents is strengthened, and it enhances their feelings of security.[3,29-31] This supports that text messaging has been proven to be a potentially useful tool in health programs (ie, health promotion and disease prevention).[32-34]

Previous studies indicate that Web-based interventions improve parents' knowledge.[35] A quasi-experimental study (N = 1,300 families) by Salonen et al[14] was conducted to evaluate the effectiveness of a Web-based intervention to support mothers' and fathers' parenting satisfaction and parenting self-efficacy. The intervention offered, among other things, online support for parenting, breastfeeding, expert advice, and an information database. Both intervention and control mothers' and fathers' parenting satisfaction and parenting self-efficacy became more positive during the postpartum period.[14] This supports the findings of our study, in that the families valued the knowledge base where they could find information. The fact that they could get the required help to deal with the many questions

and doubts they experienced gave them a sense of security.

Feeling secure is essential for parents' positive experience of early parenthood. According to Persson et al,[26,27] it is important that new parents are given relevant information in order to feel secure. Our results show that the new parents found that the automated notifications provided them with timely information. This relates to the results from the Text4baby mobile health program, which aims to provide timely information to both pregnant women and new mothers to help them improve their health and the health of their baby. The results from the pilot evaluation of the program show that the pregnant women who received the text messages were more prepared for motherhood.[36]

Another relevant factor was the option to watch the instruction videos because here it becomes possible for new parents to get information when they want it, and they can watch them repeatedly in order to check and review the information.

The new parents found the opportunity to send photos to be reassuring. They could easily get an assessment of, for instance, the baby's umbilicus. They could stay at home and still be reassured that everything was going well. This seems to add to new parents' feelings of security; Persson et al[26,27] underlined that reassurance is another important aspect in feelings of postnatal security.

Some changes had to be made to the app. In some areas, it was a challenge to use 3G because of a weak signal. Therefore, we had to cache the knowledge base, thereby making it accessible off-line. The knowledge base was originally designed to allow users to source articles on demand. However, we decided to provide a bulk download and cache the complete data set when the data set was changed.

Study Limitations

One limitation is the small sample size and the fact that the app only was tested for a short period of time. The app will be tested more thoroughly in a larger intervention in order to strengthen the conclusions.

CONCLUSION

The testing suggests that the new families and the nurses found the app viable, but the app requires refinements and wider testing. The app could be implemented, but there are challenges in the daily practice with the change of work processes on the postnatal ward that need to be addressed.

The barriers in attempting to contact health care professionals after hospital discharge were eliminated with the use of asynchronous communication. The new parents received timely information and guidance by communicating online, and their follow-up support needs were met. It seems as if there is a potential for ensuring postnatal security with the use of technology because by having their follow-up support needs met parents can achieve a sense of reassurance, which is essential for a positive start to new parenthood. JNP

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Paper III

ELSEVIER

Intervention among new parents followed up by an interview study exploring their experiences of telemedicine after early postnatal discharge

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ABSTRACT

Background: a move towards earlier postnatal discharge raises the challenge of finding new ways to support families when they are discharged early after childbirth.

Aim: to explore how postnatal parents experienced the use of telemedicine following early discharge from hospital (i.e. 24 hours after childbirth) by investigating if they consider that their postnatal needs are met, and whether or not they experience a sense of security and parental self-efficacy.

Design: intervention followed by a qualitative interview study. The intervention took place on a postnatal ward with approximately 1000 births a year. An app including chat, a knowledgebase and automated messages was trialled between postnatal parents at home and the hospital. Parents had access to the app for seven days after discharge.

Population: 42 new mothers were recruited from the postnatal ward in accordance with the inclusion criteria (i.e. discharged within 24 hours of childbirth). Both parents were invited for interview.

Methods: 42 sets of parents participated in the trial, and 28 agreed to be interviewed. Interviews (n=28) were conducted with 27 mothers and 11 fathers. Parents were interviewed together in 10 cases, 17 mothers were interviewed alone, and one father was interviewed alone. The data analysis was inspired by systematic text condensation based on Giorgi's descriptive phenomenological method.

Findings: parents were confident in use of the app, and did not experience any barriers in contacting the nurses via asynchronous communication. Parents received timely information and guidance by communicating online, and felt that their follow-up support needs were met.

Conclusions: parents viewed the app as a lifeline, and saw it as a means of informing and guiding them following early discharge from hospital after childbirth. As such, this app shows potential for enhancing self-efficacy and postnatal sense of security.

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Introduction

There is a continuing trend in many Western countries towards earlier discharge of patients from hospital after childbirth, and the average length of stay is 48–72 hours (Brown et al., 2002; Bravo et al., 2011; Sørensen, 2013).

The international literature has raised concern regarding whether there is a direct correlation between early discharge and re-admission of newborns. Reviews (Brown et al., 2002; Bravo et al., 2011) have stated that it cannot be concluded that early

postnatal discharge has consequences such as failed breast feeding, re-admission due to nutrition-related problems, and/or increased infant mortality and morbidity. It is difficult to draw precise conclusions due to between-study variations in antenatal preparation, definitions of early discharge and the types of follow-up offered.

Qualitiative studies have shown that new mothers, and their partners, who are discharged early from hospital experience a lack of support, have many doubts and feel insecure (McLachlan et al., 2009; Johansson et al., 2010; Persson et al., 2011; Danbjørg et al., 2013). A sense of security is important as it may influence an individual's journey towards becoming an effective parent. Persson and Dykes developed the concept 'sense of security', and identified the following dimensions that affect parents' postnatal

sense of security: health-care professionals' empowering behaviour; affinity within the family; autonomy; mother's physical well-being; and father's feeling of participation (Persson and Dykes, 2002, 2009; Persson et al., 2007, 2011, 2012).

Support is also essential when becoming a parent. Barclay et al. (1997) reported that one of the mediating factors in becoming a mother is 'the nature of social support available', which includes partner, family, friends and health professionals.

A study focusing on contributory factors to parental self-efficacy (Salonen et al., 2009, 2010, 2011, 2014) found that parents, and especially fathers, benefit from family-focused care and thorough support from health-care professionals. Parental self-efficacy is defined as 'beliefs or judgments that a parent holds of their capabilities to organise and execute a set of tasks related to parenting a child' (De Montigny and Lacharité, 2005).

Perceived parental self-efficacy plays an important role in adapting to parenthood, emotional well-being and closer attachment to the baby (Bandura, 1997; De Montigny and Lacharité, 2005). Bandura clarified what it is that enables an individual to build self-efficacy beliefs. Two important aspects are mastery learning (where one can gain positive experiences when doing things oneself) and vicarious experiences (i.e. seeing others perform) (Bandura, 1977, 1997).

In 2011, a policy regarding postnatal stay was issued by the Region of Southern Denmark specifying that early postnatal discharge (between 4 and 24 hours) was to become common practice following uncomplicated pregnancy and delivery for first-time and multiparous mothers. Within 24 hours of discharge, families would receive a telephone call at home from a midwife; this would be followed by a visit to the outpatient clinic 48 hours after discharge, when the newborn would have a blood sample drawn and a hearing test administered. During the four to five days following childbirth, families could visit the outpatient clinic for a check-up if needed, and they would have access to telephone consultations around the clock.

An interview study, conducted after the change in the policy, revealed new parents' experiences of postnatal care. It found that they wanted more access to the health-care system during the postnatal period. They experienced a barrier in contacting health-care professionals after hospital discharge because they felt that telephoning would disturb the health-care professionals. As a consequence, they asked for new ways to communicate that would eliminate this barrier, and meet their needs for more individualised and timely information and support (Danbjørg et al., 2014a, 2014b).

This shift in postnatal care presents a challenge in terms of finding new ways to provide sufficient support to meet the needs of new parents with follow-up that can enhance parental self-efficacy and a sense of postnatal security.

Telemedicine can provide innovative solutions to offering health-care services. Telemedicine involves the delivery of health care and the exchange of health-care information over a distance (World Health Organization, 1997).

Telemedicine has been developed and implemented in other health fields (e.g. diabetes, chronic obstructive pulmonary disease). Potential benefits include improved access to information (Hjelm, 2005). Telemedicine has also been developed within obstetrics practice (Lindberg et al., 2007, 2009; Magann et al., 2011; Salonen et al., 2011; Odibo et al., 2013). The research suggests that telemedicine may be a means of providing appropriate support for mothers, and their families, following early hospital discharge as it offers alternative ways in which they can be guided by health-care professionals in their transition into parenthood.

The literature indicates that it could be possible to meet the follow-up support needs of these parents by implementing innovative communication methods, such as online communication and an evidence-based information knowledgebase (Danbjørg et al., 2014a, 2014b). The authors wanted to explore this potential, and therefore designed and developed a software application (app) together with the users. The app was tested in a pilot study prior to the intervention (Danbjørg et al., 2014a, 2014b).

Aim

The aim of this study was to explore how postnatal parents experienced the use of telemedicine following early hospital discharge (i.e. 24 hours after childbirth) by investigating if they considered that their postnatal needs were met, and whether or not they experienced a sense of security and parental self-efficacy.

Methods

Design

This study had a participatory design, combining the use of qualitative methods and an intervention, based on collaboration with users. The participatory approach involves defining problems and indicating solutions in designing sustainable information technology solutions for practice.

An interpretative perspective using qualitative methods was applied. The interpretative approach focuses on understanding experiences, and how humans make sense of their subjective reality and attach meaning to it (Titchen and Binnie, 1994; Kensing, 2003). This approach is inspired by hermeneutics philosophy where the perspective has been to understand the participants' lived experiences (Kvale, 1996).

Participatory design has its origins in action research (Kensing, 2003; Bødker et al., 2004; Wagner, 2006; Clemensen et al., 2007). Action research spans a wide landscape of differentiated, but primarily qualitative, research strategies for bringing about change through action, and developing and improving practice (Titchen and Binnie, 1994).

Intervention

An app was tested for communication between hospital staff and new parents at home. The new parents had access to the app for seven days after hospital discharge. The app has the following functionalities:

- asynchronous communication (i.e. online chat), where the parents could send text messages and photos to the health-care professionals, as well as photos and videos, and receive an answer within four hours;
- a knowledgebase consisting of information material (articles and videos) with a search function; and
- messages issued automatically every 12 hours from the time of birth (when the family are registered on the system) that relate to the age of the baby, and provide the parents with information about breast feeding, baby's first bowel movement, etc. (Figs. 1 and 2).

Sample and context

Forty-two new mothers were recruited from the postnatal ward in accordance with the inclusion criteria (i.e. postnatal mothers discharged no later than 24 hours after childbirth, who had experienced an uncomplicated pregnancy and birth). The
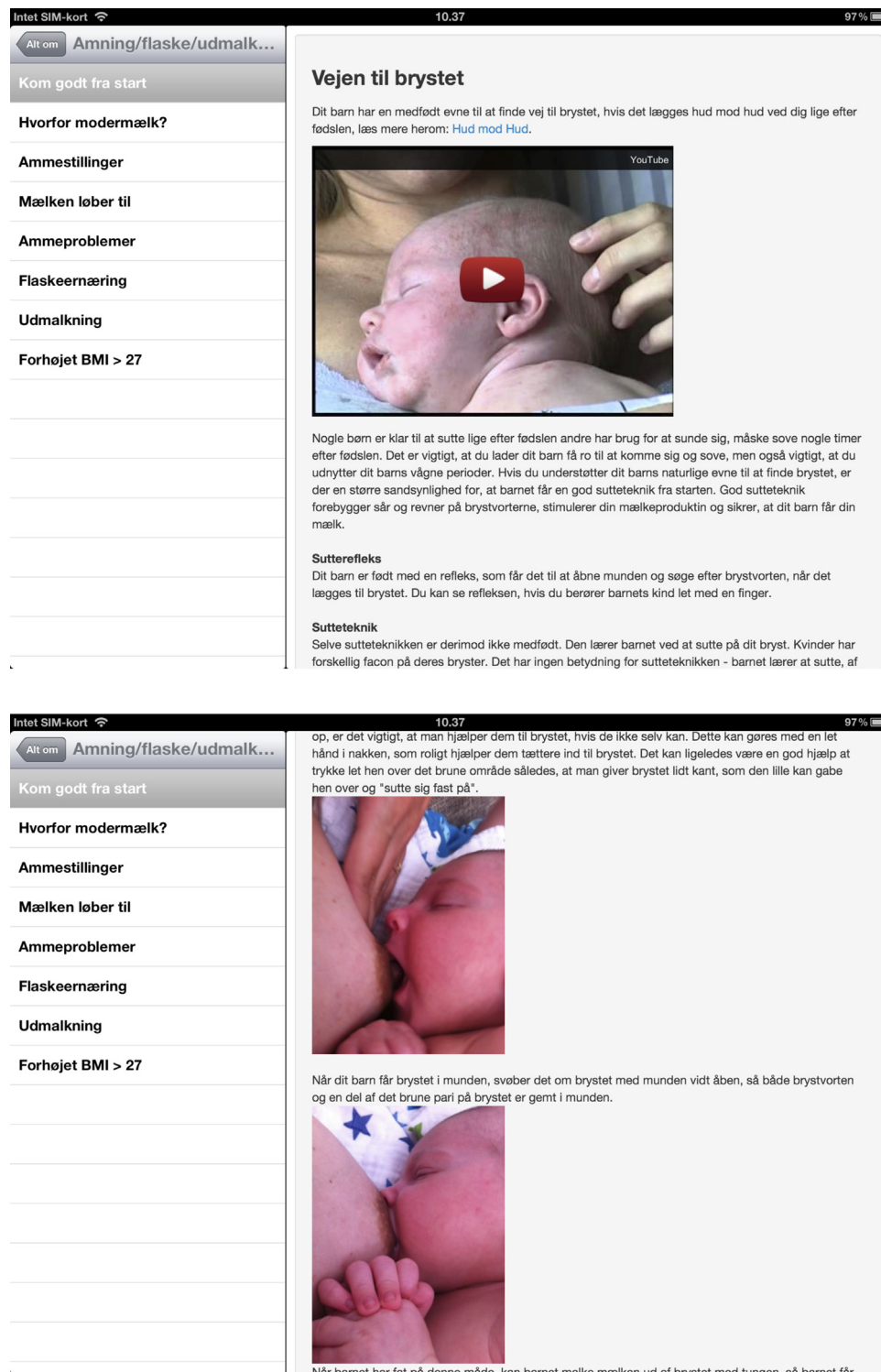
Fig. 1. Screendumps of the app.

midwife or nurse made the assessment of eligibility. Only healthy (physically and mentally) adult parents of term healthy newborns were included. Mothers who did not speak Danish were excluded from the study.

Due to the participatory design, both the first author and the nurses on the postnatal ward included the mothers. The mothers received oral and written information about the project, and were given time to consider their participation.

Convenience sampling was applied (Polit et al., 2001), as the sampling process had to be feasible for the nurses during their busy working day. Due to the convenience sampling, mothers who did not wish to participate were not registered systematically. However, it is believed that few mothers declined to participate; one said that they were not 'into' technology, and another explained that they did not feel the need for extra help as it was their fifth child.

Once agreement to participate was received, both parents filled out a form on which they provided demographic details.

Parents were given an iPad to take home on loan on which the app was installed. They had access to the app for seven days. They
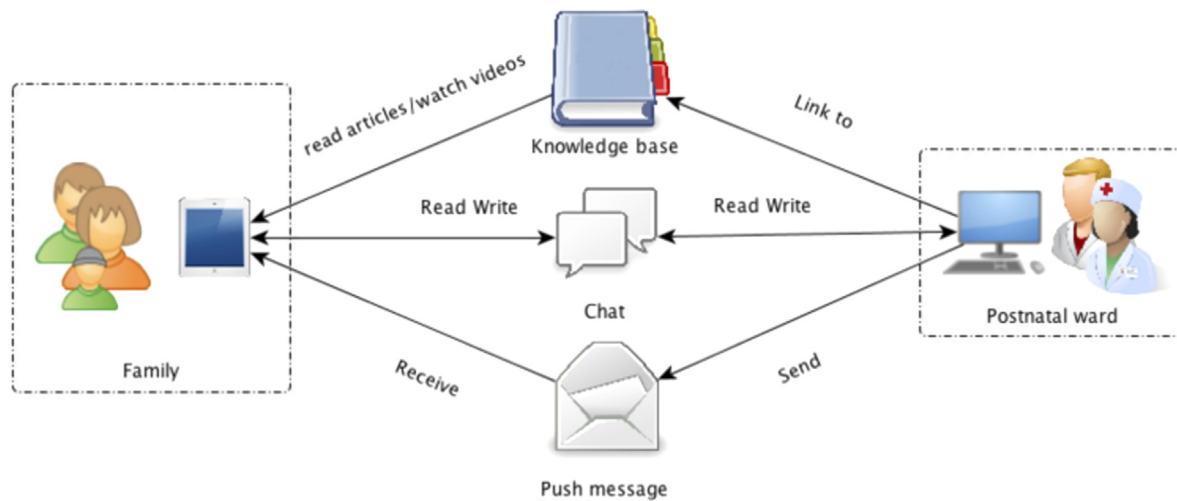
Fig. 2. Me and my baby.

were to return the iPad to the hospital after seven days in a pre-paid package.

As well as access to the app, the families had access to the conventional postnatal care at the hospital, which was described in the Section 'Introduction'.

Data collection

The mothers were recruited on the labour ward or the post-natal ward. Both parents were invited for interview, as they both had access to the app. Parents were contacted by text message or telephone to make interview arrangements. Three attempts were made to contact parents, after which they were left undisturbed.

Fourteen sets of parents did not attend for interview. Of these, two sets of parents were excluded due to technical problems, and two sets had changed their mind about being interviewed (one mother did not feel that her Danish was good enough and one mother did not have the energy). Three sets of parents cancelled their interview appointment. Seven sets of parents did not respond to text messages and telephone calls. It appeared to be difficult to make interview appointments due to having a newborn at home.

Interviews ($n=28$) were conducted with 27 mothers and 11 fathers. Parents were interviewed together in 10 cases, 17 mothers were interviewed alone, and one father was interviewed alone. In total, 21 interviews took place at the family's home, and seven were telephone interviews.

Six mothers were discharged directly from the labour ward, and 22 mothers were admitted to the postnatal ward and discharged within 24 hours of childbirth. Seven mothers were first-time parents, of whom one mother was discharged directly from the delivery ward.

Two mothers were re-admitted; one with problems related to breast feeding and the other with sepsis caused by mastitis. They were interviewed as they could still contribute with their experiences of the use of the app after early postnatal discharge.

Parents' ages ranged from 19 to 44 years. All parents lived with their respective partners. This was by coincidence and not part of the inclusion criteria. The educational level of the parents ranged from secondary school to higher education. Twenty-four parents were employed, one was unemployed and three were students.

A semi-structured interview guide was compiled, and included the themes that the authors wished to address and suggestions for questions (Kvale, 1996). It was developed with inspiration from theories on self-efficacy (Bandura, 1977) and postnatal sense of security (Persson and Dykes, 2002). It focused on the following themes: (1) experience with technology; (2) the app in relation to the individual's postnatal follow-up support needs and access to the health-care system; (3) feelings of security and parenting self-efficacy; and (4) communicating online and in writing.

The interviews lasted between 11 and 76 minutes (average 35 minutes), and were audio-recorded and transcribed verbatim.

Data analysis

The data analysis was inspired by Malterud's systematic text condensation (STC) (Malterud, 2003), and organised according to the steps taken in the analysis (Table 1). STC is a descriptive and explorative method used in the analysis of qualitative data, such as interview studies, observational studies and in the analysis of written texts (Malterud, 2012). Giorgi's psychological phenomenological analysis was the starting point for STC. He developed the descriptive phenomenological method in psychology (Giorgi, 1985; Kvale, 1996; Malterud, 2012). STC is a development of Giorgi's principles, including four comparable steps of analysis. It is pragmatic in the sense that it is easy to follow and share due to the elaborated steps of the analysis.

Firstly, an overall impression of the data was captured, and a preliminary set of main themes was extracted. Secondly, the data were divided into meaningful topics that were relevant for the study question. Next, the meaningful topics were condensed and coded. Finally, the findings were synthesised, involving a shift from condensation to descriptions and categories. The codes were developed based on the preliminary themes identified in the first step and the theoretical framework.

In order to optimise validation, three of the researchers were involved in the analysis process. The findings were subsequently discussed in relation to the theoretical framework and relevant literature.

Ethical considerations

Parents were informed both orally and in writing about the study, and were included after providing their informed consent in compliance with the Declaration of Helsinki (55th WMA General Assembly, 2008).

The study was submitted to the Scientific Ethics Committee, which decided that approval from an ethics committee was

Table 1
Analysis process: examples.

Step 1. From medley to themes. Superior themes were extracted after the first open reading of the text	Step 2. From themes to codes. Identifying the meaningful units. The meaningful units were coded based on the superior themes as well as the preconceptions and the theoretical framework		Step 3. From codes to meaning. The meaningful units were sorted into groups with respect to the codes; hereby overall categories arose from the coding process, which were divided into subcategories
Too much information Continual information	Quotations 'All that information, no one can retain that, if you are on your way home. It is an advantage that it comes continually' (Father, 14b).	[code] [timely information]	Timely information gives a feeling of control, support and reassurance
Videos Face to face Watch again	'It was really helpful to talk to someone about it when trying to position the baby, but it was also helpful to go home and then watch it on the video, because in any case you will have forgotten something […] that's how we have used it. Went home, and then watched it again.' (Mother, 18a)	[videos supporting and guiding]	Technology provides an accessible means of informing, supporting and guiding new parents

unnecessary according to national legislation in Denmark (S-20110171). The Danish Data Protection Agency registered the study (2008-58-0035).

Findings

All parents reported that technology was, to some extent, an integrated part of their daily life. All but one mother had a smartphone and, in that case, the father had a smartphone. The mother reported that she did use a computer and the Internet occasionally.

Many parents owned computers, smartphones and tablets. The majority of parents searched the Internet, both in general and for information related to pregnancy and becoming a parent. Parents did not generally use a computer or laptop to search, but primarily used their smartphones or mobile devices because they found them quicker and more convenient. Parents were also accustomed to using apps. They found that the study app functioned well and was easy to use.

Data analysis identified the following categories: 'Timely information gives a feeling of control, support and reassurance', 'Technology provides an accessible means of informing, supporting and guiding new parents' and 'Written asynchronous communication offers an accessible way to seek help after early discharge'.

Timely information gives a feeling of control, support and reassurance

Both first-time and multiparous parents reported that timely, continuous information was required when the mother was discharged early, because they could not retain too much general information during their short hospital stay. Therefore, the automated messages issued every 12 hours from the time of birth were well received:

All that information, no one can retain that, if you are on your way home. It is an advantage that it comes continually. (Father, 14b, multipara)

Parents found it acceptable to receive the information in writing instead of orally, and felt that it was valuable that they got the information at times that suited them:

It was ok. And you receive the message when you have the energy to read it. (Mother, 14a, multipara)

Despite the fact that the messages were automated and to some extent 'generalised', the parents found that they offered them individualised information. One family said that the automated messages were 'spot on':

I wrote a question and around half an hour later came the answer to the question that I had asked [he laughs]. I didn't think any more about it. I hadn't noticed that it was an automated message, until another message popped up from the nurse, where she pointed out that the first one was automated. Then I realised that the first one had been an automated message. (Father, 7b, multipara)

Both first-time and multiparous parents read the messages. The multiparous parents reported that it was a quick way to be updated. Despite the fact that they were experienced parents, they felt that there was so much that they had forgotten, and they felt that the automated messages provided reassurance that all was well.

The majority of parents requested more messages. Some of the mothers wanted more information about their own restitution. Others would have liked to have used the app for a longer period:

With an app like this it could be useful, if it was for a longer period of time. Because there is now f weeks till the health visitor will come again. There is a gap. And then we Google. (Mother 7a, multiparous)

Parents explained that they also had a need for timely information after the first seven days, and that the app could have been useful during pregnancy:

It could have been ingenious, that you could get messages from the day you find out that you are pregnant. And to be told be aware of this and that. (Father, 41b, primipara)

Parents could read the messages to get a quick overview, and if they had further questions, they could look at the interactive links for more thorough information:

I read them and it was smart with the links. […]. It is easier to activate a link than to sit with 25 pamphlets. (Mother, 33, multipara)

However, two mothers felt stressed by the messages and thought it would have been helpful if they had been made clearer. One mother explained:

And when you get a message from the postnatal ward: 'Now your baby must have at least four heavy nappies a day' – and she didn't. Boy, did that stress me. So I had to seek more information about that. (Mother, 23a, primipara)

Technology provides an accessible means of informing and supporting new parents

The information appeared to be more accessible when digitalised rather than in paper form; parents found it easier to get an overview of the information material and search through it by themselves instead of asking someone:

> I have read it all. I also look things up that I would not ask the nurse. (Mother, 4, primipara)

The app also offered the opportunity to watch a range of instruction videos (e.g. different breast-feeding positions, how to wash the baby, etc.). Parents reported that it was an advantage to be able to watch the videos whenever they had the time, and that they could watch a video repeatedly if they did not understand the information the first time. They compared use of the videos with face-to-face guidance with the health-care professionals at the postnatal ward, and underlined the fact that a short hospital stay could be hectic because they received so much information and guidance within a relatively short period of time. It could also be stressful to have to attend an information meeting at a specific time, because the baby might need to have its nappy changed or it could clash with breast-feeding times or having visitors:

> It was actually better to do it when we came home, in peace and quiet. It wasn't something acute. (Father 23b, primipara)

One mother reported that she watched a video after attending breast-feeding counselling at the hospital:

> It was really helpful to talk to someone about it when trying to position the baby, but it was also helpful to go home and then watch it on the video, because in any case you will have forgotten something […] that's how we have used it. Went home, and then watched it again. (Mother, 18a, multipara)

Written asynchronous communication offers an accessible way to seek help after early discharge

Parents found it easy to contact the health-care professionals via the app using online chat. They reported that they did not hesitate to contact the nurses if they had any doubts, as opposed to having to make a telephone call and perhaps disturb the nurse in her work. They used the online chat in favour of telephoning the nurses:

> I feel that it would have to be more acute [before I would call the nurse]. Something I need help with right here and now. You can use this (chat) for less important things. I also feel that it would be inconvenient [for the nurse], if I called all the time. (Mother, 32, multipara)

Parents also stated that they might forget some of their questions if they were on the telephone. It was easier to remember questions when they could write them down in advance and in their own time.

The answers from the health-care professionals were also easy to understand, even though they were in writing:

> They were easy to understand and they were long, useful answers, not just short: you have to do this and that. There was an explanation; you have to do this and that, because of this. (Mother, 6, primipara)

The option of sending photographs to the hospital reduced the need for some parents to attend the hospital for a check-up. A mother who lived 40 minutes away from the hospital sent a photograph to the postnatal ward because she was worried that there was something wrong with the umbilicus:

> But when she asked 'can you come in for a check up?', oh no, I couldn't cope with that, the long drive and what about the older (sibling), she was at home. And then she said that I could send a photo […] The fact that I could send photos to them […]. It was so reassuring. And that I could stay at home. (Mother, 10, multipara)

Early discharge from hospital was given a great deal of consideration, with parents reporting positive, negative and ambivalent feelings. Most parents felt that they had taken part in the decision about when to be discharged, but some of them stated that they had been told that they had to be discharged within 24 hours if everything went well:

> I thought it sounded terrible. Or both and, because I could see the point, when I now have two children, you know there is someone you want to go home to. But I think that it would be nice to stay there, just till you feel secure. And then there is the older sibling that needs attention, and then when you at the same time are a bit insecure about everything. We were ambivalent. (Mother, 33, multipara)

The new parents reported that it was important to them that they had a say in when they were discharged, and that they did not have to fit in to a standardised care framework:

> There was some humanity. It was not just, we have to conform the rules, no we will find a solution if you are insecure. (Father, 16b, primipara)

On the positive side, parents, particularly multiparous parents, underlined the importance of being together as a family when at home:

> This time I wanted to go home to the big one […] (Mother, 10, multipara)

Some of the parents who felt insecure saw the app as a lifeline:

> But it was reassuring to know that if there was something that we wanted to get an answer to and that we couldn't find out by ourselves, then we could write. It was kind of a lifeline to bring it home. (Mother, 40a, multipara)

It seemed that the app provided parents with access to the health-care staff while encouraging them to act more independently, as they searched for information themselves. Some parents reported that they had looked things up that they would not have asked about:

> Well I think that it was really good. I used it a lot, there are so many things that you are not sure about, and then instead of calling and asking about small, simple things, it was good to search for them. It made me feel calm. (Mother, 6, primipara)

Discussion

This study found that the parents were confident in use of the app and found it natural to seek information and communicate online; they did not experience any barriers in contacting the nurses using asynchronous communication. Parents received timely information and guidance by communicating online, and felt that their follow-up support needs were met.

The study involved both first-time and multiparous parents, and both were found to need information and support. Although multiparous parents have experience, they still need reassurance and timely information.

Automated messages were found to be a suitable way of informing and guiding the parents, and preparing them for their new role as a parent. When they received timely information, the parents felt supported and reassured that their newborn was healthy and that they were in control; both of which are factors in enhancing a sense of security (Persson and Dykes, 2002). This was also found by the Text4baby mobile health programme, which aimed to provide timely information to both pregnant women and new mothers to help them improve their health and the health of their baby. The results from the pilot evaluation of the programme show that the pregnant women who received the text messages were more prepared for motherhood (Evans et al., 2012).

However, two mothers reported that the automated messages stressed them. It is important to underline that it was not the intention that the automated messages should stand alone, as the app also included the facility to contact the health-care professionals (online chat), and the discharged parents were able to contact the hospital by telephone around the clock. The automated message facility can also operate as an alert function, in that it could prevent a potentially harmful situation from occurring (e.g. without the messages, parents could perhaps overlook important signs of their baby's failure to thrive).

The new parents felt that being at home was favourable compared with being in hospital when it came to being together as a family. Early discharge makes it possible for the whole family to be together, which has a positive impact on affinity within the family (Persson and Dykes, 2002). In particular, the fathers and the multiparous parents stressed the importance of being together as a family with the newborn's siblings.

However, the parents highlighted the need for follow-up support following early discharge, and they experienced the app as a lifeline whereby they could seek help and advice. Other studies have also found that when mothers are discharged, it is essential that they are able to get professional support whenever needed (Sørensen and Hall, 2004; Löf et al., 2006; Lindberg et al., 2009). Accessibility to support from health-care professionals is an essential element in the experience of a postnatal sense of security (Persson et al., 2007, 2011, 2012; Kvist and Persson, 2009).

To some extent, the app made parents act more independently because they could look things up easily for themselves. They reported that, without the app, they would have contacted the hospital because it would have been too much trouble to find the information in a pile of pamphlets. Acting independently and gaining one's own experience is a way of achieving mastery experiences, which strengthens parental self-efficacy (Bandura, 1997). Parents stated that it was beneficial to be able to watch the videos at a time that suited them, and they also emphasised the usefulness of seeing others perform relevant activities (e.g. breast feeding or bathing a baby). Vicarious experiences can generate an expectation in parents that they will also be able to perform the task (i.e. if others can do it, they should also be able to achieve success) (Bandura, 1977).

Asynchronous communication was reported to be of essential importance in the parents' experience of the app as a lifeline. Parents found it easy to seek help, the health-care professionals were accessible, and the parents did not experience any barriers in contacting the professionals for advice. They did not feel that they were disturbing the staff when sending a written message, in comparison with making a synchronous phone call. This has been described in the literature as an issue because new parents are reluctant to contact health-care professionals in case they disturb them, even when they have important questions (Johansson et al., 2010; Danbjørg et al., 2013). Other studies within different specialties have also shown that asynchronous communication can be a way to overcome this barrier. Bjoernes et al. explored the possibility of online contact between health-care professionals and

men with prostate cancer ($n=34$) who experienced short hospital stays. These patients were able to access health-care professionals using asynchronous online communication (e-mail). Their need for individualised information and support was accommodated (Bjoernes et al., 2012).

A report from the Institute for Healthcare Informatics (IMS Institute for Healthcare Informatics, 2014) showed that patients also use social media for emotional support, which indicates that people no longer feel that they can only get emotional support through face-to-face dialogue. The report concluded that there have been essential changes in the ways that people communicate, and as a consequence, the new technologies will change how health care operates on a global scale (IMS Institute for Healthcare Informatics, 2014). This development is also underpinned by a review by Plantin and Daneback (2009), which showed that the majority of today's parents search for both information and social support on the internet. As a result of this development and because of the reduction in face-to-face contact, it has become more common for hospital staff to communicate online (Salonen et al., 2011, 2014) and offer telephone support (Lavender et al., 2013) following early discharge.

Although the parents in this study felt secure after discharge with the use of an app, the fact that they were being discharged early was an issue for consideration. This has also been found in other studies, and it seems that the main factor affecting parents' feelings of security after early discharge is whether or not they were involved in the decision and timing regarding discharge, and do not feel that they were being forced out of the hospital (Forster et al., 2008; Johansson et al., 2010; Danbjørg et al., 2013; Sørensen, 2013).

Limitations

In the joint interviews, although both parents participated actively, the disadvantages and advantages of interviewing two people at the same time must be considered. Conducting individual interviews helps to prevent a situation where one parent is more talkative, making the other parent more passive. However, joint interviews were used as the authors wanted to create a social interaction that could bring out the new parents' experiences, both individually and as a couple.

Another limitation is that this was a small-scale study. It was not the intention of this study to generalise, but rather to understand and explain how new parents experience the use of an app in the postnatal period after early discharge.

Also, the authors were only able to interview just over half of the parents who had used the app. Future research may need to consider ways to overcome the difficulties of getting feedback from this group of participants, such as a questionnaire built into the app.

An implementation seminar has been held; the findings were highlighted and the nurses were made aware of the concerns of some of the families regarding use of the app. These findings were used to refine the app, focusing on more varied information such as issues concerning the mother's condition, and different wording in the information material to reduce potential stress of the parents.

Conclusions and implications

Parents viewed the app as a lifeline, and saw it as a means of informing and guiding them. However, it is important to note that one of the main contributory factors to feeling secure is a parents' sense of being in control, which underlines the importance of involvement in decision making about when to be discharged.

The functionalities of this app (i.e. chat, knowledgebase and automated messages) met the needs of the new parents, and induced a sense of security and parental self-efficacy.

Potential for the use of the app in postnatal care needs to be investigated in future research, preferably in a large-scale study.

Conflict of interest

There are no conflicts of interest.

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Paper IV

Research Article

Nurses' Experience of Using an Application to Support New Parents after Early Discharge: An Intervention Study

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Background. A development towards earlier postnatal discharge presents a challenge to find new ways to provide information and support to families. A possibility is the use of telemedicine. *Objective.* To explore how using an app in nursing practice affects the nurses' ability to offer support and information to postnatal mothers who are discharged early and their families. *Design.* Participatory design. An app with a chat, a knowledgebase, and automated messages was tried out between hospital and parents at home. *Settings.* The intervention took place on a postnatal ward with approximately 1,000 births a year. *Participants.* At the onset of the intervention, 17 nurses, all women, were working on the ward. At the end of the intervention, 16 nurses were employed, all women. *Methods.* Participant observation and two focus group interviews. The data analysis was inspired by systematic text condensation. *Results.* The nurses on the postnatal ward consider that the use of the app gives families easier access to timely information and support. *Conclusions.* The app gives the nurses the possibility to offer support and information to the parents being early discharged. The app is experienced as a lifeline that connects the homes of the new parents with the hospital.

1. Background

Since the 1990s, the average length of postnatal hospital stay has declined, both in Denmark and internationally. The most prominent reasons are a renewed focus on the fact that giving birth is not a disease and the general need for cost savings in the healthcare system [1–4]. In Denmark, the average length of postnatal hospitalization has decreased from 92 hours in 2007 to 77 hours in 2012 [3].

A Danish questionnaire study (N = 1,507 women) identified that 44.3% of the women who were discharged early (within 24 hours) from postnatal care experienced a lack of follow-up support; that is, they felt that they did not receive the support needed to care for the newborn; 37.5% did not receive support for postnatal self-care, and 46.1% did not receive adequate support around breastfeeding [5]. These findings concur with results in international research [2, 6, 7].

Studies show that new parents experience concerns, uncertainty, doubts, and feelings of insecurity during the postnatal period and are in need of follow-up support after early discharge [2, 6, 8–10]. Support is important when becoming a parent—Barclay et al. underline that one of the mediating factors in becoming a mother is "the nature of social support available," which includes partner, family, friends, and health professionals [11].

A sense of security is a central element to support as it might influence a parent's journey towards becoming a successful parent. Persson et al. have developed the concept "parents' postnatal sense of security." They identified the following dimensions as important for both parents' postnatal sense of security: empowerment from staff, affinity within the family, and the health and wellbeing of the family. An empowering organisation was fundamental for strengthening this [9, 12–15].

If the parents feel insecure it can have a negative effect on parental self-efficacy (PSE). The definition of PSE is as follows: "beliefs or judgments a parent holds of their capabilities to organize and execute a set of tasks related

to parenting a child" [16]. For parents to employ parenting behavior positively, they must have confidence in performing the specific behavior. Parents with high self-efficacy are likely to make a greater effort than parents with low self-efficacy. Bandura has clarified what it is that enables an individual to build self-efficacy beliefs. Important aspects are mastery learning, where you can gain positive experiences, when you are doing things yourselves, vicarious experiences, that is, seeing others perform, and verbal persuasion, where others assure you that you hold the ability to perform a certain task [17, 18].

The new trend towards shorter hospital stays has affected healthcare professionals' practice. They experience that they have too little time to support new parents and to give individualised and timely information [6, 19].

In 2011, The Region of Southern Denmark issued a new policy regarding the postnatal period, in which early postnatal discharge (i.e., from four to six hours; max. 24 hours) was to become general practice following uncomplicated delivery for first-time and multiparous mothers. This shift in the postnatal care presents a challenge in terms of finding new ways to provide the sufficient support that meet the needs of the new parents with a postnatal follow-up that can enhance PSE and a sense of postnatal security.

One possibility is the use of telemedicine, which can provide an innovative solution [20–22].

Telemedicine has also been developed within obstetrics practice [23–27]. It seems that telemedicine has the potential to provide appropriate support to early discharged mothers and their families, because it offers the possibility for new parents to be guided by healthcare professionals in their transition into parenthood. Findings by Lindberg show that both parents and healthcare professionals find that telemedicine has the potential to provide appropriate support because it presents new ways to communicate that can substitute for face-to-face contact and it can be a valuable and functional complement to usual practice [25, 26].

We wanted to explore this potential and therefore designed and developed a software application (app), which was tested in a pilot study prior to the intervention [28].

1.1. Aim.
The aim is to explore how nurses experience using an app in nursing practice and how it impacts their ability to offer support and information to postnatal mothers who are discharged early and their families, in a way that will enhance the families' sense of security and self-efficacy.

2. Methods, Participants, and Data Collection

2.1. Design.
This study applied a participatory design (PD). It combines the use of qualitative methods and intervention, based on collaboration with users. The PD approach involves defining problems and indicating solutions in designing sustainable IT solutions for practice together with the users. An essential aspect of designing and developing a new technology is the intervention phase, where the actual technology is tried out in practice and concrete experiences with the use of the new technology are gained. Participatory design

can be viewed as hermeneutics, where new understanding is developed through a circular collaboration between the researcher's understanding and an attempt to interpret a certain phenomenon in collaboration with the participants [29].

PD has its origins in action research [29–32]. Action research spans a wide landscape of differentiated, but primarily qualitative, research strategies for bringing about change through action, developing and improving practice [33].

2.2. Intervention.
This study was an intervention study where an app was tested between hospital staff and new parents at home following early postnatal discharge. The content, format, and style of the app were designed on the basis of the parents' identified needs, in close cooperation with the nurses on the postnatal ward, and with the assistance of a team of computer programmers. The identified needs have previously been reported in depth [6].

In brief, new families requested an individualised postnatal follow-up, timely information and guidance, and accessibility to, and new ways to communicate with, healthcare professionals. This reflected the professional concern that the nurses had as to how they can ensure a postnatal care, which will ensure a sense of security, wellbeing, and parental self-efficacy, when the new parents are being early discharged. The app was designed with the following functionalities that should accommodate the needs of the early discharged parents.

(1) Asynchronous communication, online chat, where the families could send text messages to the healthcare professionals as well as photos and videos and receive an answer within four hours. This method of communication may diminish the barrier in accessing healthcare professionals after hospital discharge.

(2) A knowledgebase consisting of information material with a search function for easier access to information. The information material was evidence-based and written and compiled by the nurses on the ward. The information material consisted of written material about the postnatal period, for instance, information about breastfeeding, skin-to-skin contact, the mother's restitution after giving birth, and practical advice about baby care. The knowledgebase also contained instructions videos with guidance about breastfeeding, skin-to-skin contact, the wellbeing of the baby, baby clues, and how to bathe the baby.

(3) Messages sent out automatically every 12 hours from the time of birth. The messages relate to the age of the baby and should be relevant to the new parents providing them with information about breastfeeding, the baby's first bowel movement, and so on. The nurses had written down what they would normally inform and instruct the new parents about in the first postnatal days. It was rewritten into short messages that the new families would receive every 12th hour for the first 4 days after their baby was born. In
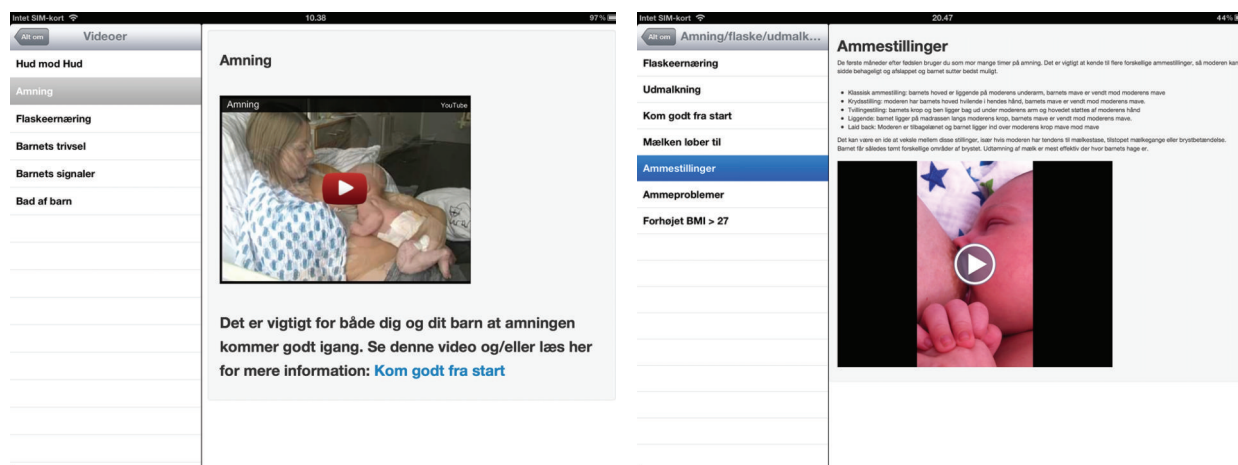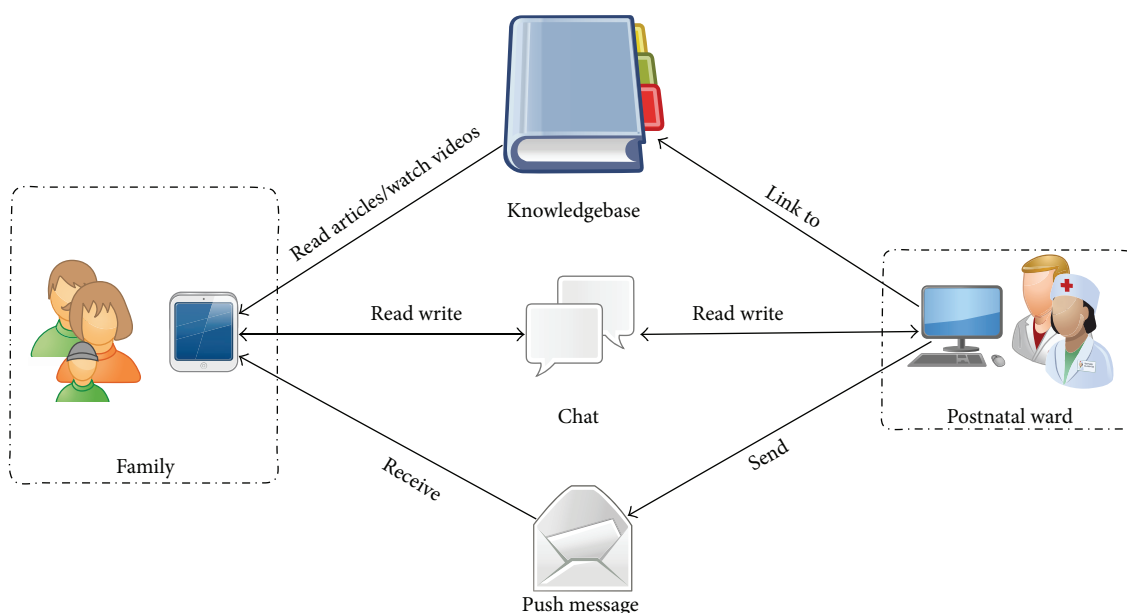
FIGURE 1

FIGURE 2

the messages there are relevant links to the knowledgebase with more thorough information. The following is an excerpt of a message.

24 hours after giving birth. Your boy has to suck efficiently at least 6–8 times a day. Your baby will often wake up and show signs of hunger, if not you [sic] have to wake him up, read more about that here: "Get a good beginning" and "Breastfeeding." (Figures 1 and 2).

The parents were given an iPad to take home on loan on which the app was installed. They had access to the app for seven days. They were to return the iPad to the hospital after seven days in a prestamped package.

Prior to the intervention, we tested the app in a pilot study [28], where the nurses were instructed in the use of the app and the accompanying website. The nurses registered the new parents on the website and used it to check for messages. The nurses were responsible for the online chat, which in practice meant that they had to check it every four hours and send replies to the families. Two of the nurses were responsible for updating the knowledgebase. These responsibilities were additional to the nurses' assigned duties involving caring for the patients admitted to the postnatal ward. No extra time was allocated in their shift for the additional work involved in answering messages.

2.3. Sample and Context. The study took place on a postnatal ward that handles approximately 1,000 births a year and included nurses employed on the ward. The management at the ward had initiated the project after the implementation of the new postnatal policy in The Region of Southern

Denmark. The nurses at the ward were all involved in the project and willing to participate in the intervention.

During the course of the study, four nurses moved job and three were employed. The newly employed nurses were introduced to the intervention. At the onset of the intervention, 17 nurses, all women, were working on the ward. Their professional postnatal experience varied from less than one year to 30 years, with a mean of 10.2 years. At the end of the intervention, there were 16 nurses employed, all women. Their professional postnatal experience varied from under one year to 30 years, with a mean of 7.1 years.

2.4. Data Collection. Participant observation was carried out on the postnatal ward from March to August 2013, on average one day a week, in all 20 days. The data were primarily collected during day shifts, though five times were also during evening shifts. The nurses were not followed through an entire shift, because the focus was how they experienced using the app in nursing practice and how it affected their ability to offer support and information to postnatal mothers who are discharged early.

The data from the participant observation are based on informal conversations with the nurses. The informal conversations took place during the nurses' coffee or lunch breaks or in the nurses' office. Sometimes they spontaneously started talking about the app, and other times we would ask a question to initiate a talk. Occasionally we were also assisting them with practical advice or help concerning the iPads or the webpage, which automatically led to conversations about the app and how they experienced using it.

Field notes were taken concurrently with a focus on place, participants, and activity. The following served as a guideline for the observations: what happens at the time of observation and what intentions and feelings occur in the situation [34].

We also conducted two focus group interviews [35, 36]. All the nurses on the ward who had taken part in the study were invited to a focus group interview. Nine out of a possible 13 nurses attended. The other nurses could not attend on the given dates, due to either work or personal matters. The number of participants who could attend on the chosen dates determined the size of each group, which ended up being four and five. The focus group interviews were held in the employee staff-room on the postnatal ward.

Before each focus group interview commenced, the moderator (the first author) introduced the purpose of the interview and clarified the guidelines and the focus: experiences using the app in nursing practice and how it affects their ability to offer support and information to postnatal mothers who are discharged early.

An interview guide was compiled. The overall theme focused on the nurses' experiences, which formed the basis of the discussion [37, 38]. Some additional questions were asked during the discussion. The development nurse on the ward participated as a comoderator, made notes during the interviews, and evaluated the atmosphere and interaction. The focus group interviews lasted 44 and 55 minutes, respectively, and were audio-recorded and transcribed verbatim.

3. Ethical Considerations

The participants received oral and written information about the study and were included after providing their informed consent, in compliance with the Helsinki Declaration [39]. The first author asked the nurses if they would like to participate in a focus group interview, and they were given time to think it over. They were told that participation was voluntary and that the focus group interviews would be held during working hours.

The study was submitted to the Scientific Ethics Committee. The committee decided that approval from an ethics committee was unnecessary according to the national legislation in Denmark (S-20110171). The Danish Data Protection Agency registered and approved the study (2008-58-0035).

4. Data Analysis

The data analysis was inspired by Malterud's systematic text condensation (STC) [40] and organised according to the steps taken in the analysis, as shown in Table 1. STC is a descriptive and explorative method used in the analysis of qualitative data, such as interview studies, observational studies, and in the analysis of written texts [41]. Giorgi's psychological phenomenological analysis was the starting point for STC. He developed the descriptive phenomenological method in psychology [38, 41, 42]. STC is a development of Giorgi's principles, including four comparable steps of analysis. It is pragmatic in the sense that it is easy to both follow and share due to the elaborated steps of the analysis.

Firstly, we captured an overall impression of the data and extracted a preliminary set of main themes.

Secondly, the data was divided into meaningful topics, which were relevant to the study question. Next, the meaningful topics were condensed and coded. Finally, the findings were synthesized, involving a shift from condensation to descriptions and categories. The codes were developed based on the preliminary themes identified in the first step and the theoretical framework.

In order to optimise validation, three researchers from the research team were involved in the analysis process. Our findings were subsequently discussed in relation to relevant literature and theory.

5. Results

The categories that emerged from the data analysis were as follows:

(1) an app as a means of providing support,

(2) an app as a means of conveying timely and accessible information.

The categories are presented below and are illustrated by quotations from the two focus group interviews (FGI) and from conversations that took place during the participant observation (PO).

TABLE 1: Process of analysis, examples from the analysis.

Step 1: from medley to themes: superior themes extracted after the first open reading of the text	Step 2: from themes to codes. Identifying the meaningful units. The meaningful units are coded based on the superior themes as well as the preunderstanding and the theoretical frame		Step 3: from codes to meaning. The meaningful units are sorted into groups with respect to the codes; hereby overall categories arise from the coding process, which then are divided into subcategories
	Quotations	[Code]	
No tears	"I answer their questions… (…). I look at the photo of the umbilicus for instance or whatever it is. But I do not have the mother's tears. It creates a distance"	*[Lack of senses]* *[one sided dialoque] [sic]*	Telemedicine as a means of providing support
Open door	"And I think that it is a help. They feel that it is ok that they take contact"	*[help available]*	
Repetition	"Then they get the pop-up messages which means they get the information one more time, that's great"	*[timely information]*	Telemedicine as a means for timely and accessible information.
A lot of information in a short time	"You are just talking, talking, talking… And how much do they really remember?"	*[Too much information]*	

5.1. An App as a Means of Providing Support

5.1.1. Adjustment to New Ways of Communicating. The nurses were hesitant at first when they had to chat online with the families, that is, using written instead of verbal communication. The following example occurred during a lunch break on the ward at the very beginning of the intervention.

> One of the nurses (nurse T) related that she had answered a message: "Well, I think it was very time consuming. It was all new to me and normally I would just talk on the phone, but I really had to think twice before sending the message". One of the other nurses (nurse K) supplemented this with: "Yes, it does take quite some time and the mother who wrote, well, how would I put it, the message wasn't well articulated". Nurse T continued: "It wasn't that it was difficult, but it just felt so different to write to a family instead of just talking". Nurse K then said: "It is probably also a matter of time—we have to get used to it." (Field note, March 2013, PO)

Another concern was that when communicating in writing, one uses fewer of the senses.

> I answer their questions (…) I look at the photo of the umbilicus, for instance, or whatever it is. But I do not have the mother's tears. It creates a distance. (Nurse I, FGI)

Though, after a period of time using the app, the nurses no longer felt that it was such a big challenge or that it involved changes to their work.

> Maybe you have to have some ping-pong, to ask the right questions, like you would have asked, if you were in the room [i.e. face to face]. But it hasn't been difficult. (Nurse D, FGI)

However, they did state that a lot depended on the type of questions that they had to answer on the online chat. Messages that were accompanied by, for example, a photo of an umbilicus were considered "easy" to answer, whereas questions about breastfeeding were more difficult, since more information and dialogue were required in order to make a judgment and give the appropriate support.

> But, that's also the point. Well, they can get answers to something very specific, but it is also the intention that where it is very complicated, and there are a lot of problems, we need to see them. (Nurse A, FGI)

The nurses stressed that the written communication cannot "stand alone," but they emphasized that there was always the option to invite the parents to come to the ward for more guidance face-to-face and that this occurred on occasion.

The nurses had to check the chat for messages every 4 hours, which showed to be a constant challenge. Explanations given for forgetting to check the online chat were that the nurses were too busy and there were challenges to adjust to the new procedures; the nurses had to go to the office to check the chat, and they usually spend most of their time in the patients' rooms or the nursery room.

> We do delegate who is responsible for the chat during the shift, but then oh no we have forgotten it. I have responded to one that was 14 hours old. (Nurse A, FGI)

5.1.2. Connecting Hospital and Home. The app gave the parents the option to stay at home, while, for instance, having the baby's umbilicus assessed, because they could send a photo. The nurses found that the possibility to send photos was an advantage instead of the parents having to explain how the umbilicus looked like, over the phone. It provided

the nurses with a more accurate impression of the umbilicus, and they experienced that it increased their possibility to provide the appropriate advice and support.

The following example shows the differences between the distinctive forms of contact the nurses used. It took place during a coffee break on the ward.

> *One of the nurses had assessed an umbilicus based on a photo sent using the online chat. She could see that the baby was red in the groin, so she also wrote a note on that to the family. One of the nurses said: "well, that would not be possible over the phone". To which another replied: "but, if they had been here [on the ward], you could have seen the whole baby, not just the groin, and then you could also check the armpits, for instance."* (Field note, March 2013, PO)

The nurses agreed that families often found it difficult to contact healthcare professionals, because they did not want to disturb, which they ascribed to cultural factors or general expectations in society.

> *I also think it is just a cultural thing. Nowadays, people with kids—they want to take care of themselves.* (Nurse D, FGI)

The nurses also discussed that the new parents were reluctant to call the ward for help, even though the nurses told them that they should always call, if they had any doubt when they had been discharged. They thought that it was because the parents had experienced that the nurses were busy, and then they did not want to disturb.

> *They find it difficult to take contact. They feel it is inconvenient, because they have experienced that we were busy.* (Nurse V, FGI)

The nurses experienced that the app gave the families an opportunity to make contact with them after discharge, where they did not feel that they were intruding.

> *And I think that's a help. They feel that it is ok that they make contact.* (Nurse V, FGI)

5.2. An App as a Means of Conveying Timely and Accessible Information

5.2.1. Accessible Information. The nurses emphasized that one of the advantages of the app was that the information material for the parents was in digital instead of paper form.

> *Paper, it is all over, a mess, whereas the iPad—they know where that is. It suits them. Paper doesn't.* (Nurse I, FGI)

The nurses expressed that there was a lot of information material handed out at the hospital, and they questioned how much of it the families actually read. They considered it an advantage that it was now in digital form, as it seemed to appeal more to the families, because they could easily access

it on the iPad and they could also search within the material in the same way as using "Google" or other search engines.

Another possibility was watching the instruction videos. The nurses experienced that this was a suitable way for the new parents to be guided. For instance, the nurses at the ward showed the admitted parents how to bathe the baby, but this was at a fixed time during the day, and if the parents watched the video, they could watch it whenever they wanted.

> *When they are admitted for such a short time, it becomes very hectic to tell and show them everything. This way they can do it, when they want to and also when they are at home.* (Nurse K, FGI)

They also found that it was easy for them to refer to a video or a written instruction.

> *Well she wrote me a question, and I answer her back, but I also wrote that I thought she should read the information, it was easy to do, because I knew that she could find it easily on the app.* (Nurse S, June 2013, PO)

The nurses told that the parents reported that they felt secure with the app. They knew where to look for the information, and at the same time they knew that they could easily get in contact with the nurses at the ward.

> *And then she [a mother] told me that she was so secure, because it was just like having a nurse standing outside the door.* (Nurse B, August 2013, PO)

5.2.2. Timely Information. The nurses had to adjust to the new policy with the early discharge. It stressed them because they had shorter time with the individual family.

> *Well they come from the delivery ward, and then they are here for such a short period of time. And they sometimes just fall asleep, when I talk to them. They need something differently.* (Nurse V, FGI)

The nurses expressed that it was reassuring to know that when the families were discharged with the app they were drip-fed information in the form of automated messages. It relieved some the pressure they might feel when discharging mothers early, in terms of the duty to "have informed thoroughly enough."

> *I think that there is so much information that they need in such a short time. Then you are just talking and talking, while you think, how much do they remember, when they come home.* (Nurse A, FGI)

The nurses often had a feeling that the families could not retain all the general information. The nurses considered that the automated messages seemed to meet this challenge by providing families with timely information.

> *Knowing that, if there is something that I have forgotten, they get the pop-up messages, which*

Functions of the app	Aspects supported	Supports
Knowledgebase, videos & information	Possibility for consistent relevant information	PPSS
	Acting independently (mastery experiences)	PSE/PPSS
	Seeing others perform, for instance, videos about breastfeeding (vicarious experiences)	PSE
Automated messages	Timely information	PPSS
	Being reassured (verbal persuasion)	PSE/PPSS
Online chat, asynchronous communication	Access to healthcare	PPSS
	Being reassured (verbal persuasion)	PSE
	Support (verbal persuasion)	PSE/PPSS

means they get the information one more time, that's great. (Nurse A, FGI)

The nurses regarded the automated messages that the families received as a tool to stimulate the families' curiosity and also their capacity to take control of their situation. The nurses believed that because of the interactive links in the automated messages, when the parents read the messages, they could easily read additional information material in the knowledgebase or they could address a question to the nurses on the postnatal ward. The nurses experienced that the parents took control of their situation and the messages made the parents feel well prepared for the postnatal period. The messages served either to reassure them or to allow them to react, if they required more information or support.

It is like a pat on the shoulder. Everything is ok. (Nurse D, FGI)

6. Discussion

In this study, we found that the nurses consider that the app gives them the possibility to offer support to the families discharged early, as it provided easier access to timely information and support, and it enhanced opportunities for families to initiate contact after discharge. They nurses find that the app connects the homes and the hospital.

The nurses state that the written asynchronous environment offers an easy way to offer families support. They feel that it connects the hospital setting with the home and goes some way towards reducing the gap, which families can experience as a barrier, in the fact that they are reluctant to contact the hospital staff for support after discharge [2, 6, 43]. Other studies have also found that when new families are discharged, it is essential that they are able to get professional support whenever they need it [25, 44, 45]. Persson et al. have identified that accessibility to support from healthcare professionals is an essential part of experiencing a postnatal sense of security [9, 14, 15, 46] (Table 2).

The nurses regard the app as a lifeline for families because it increases access to professional support. The app constitutes a new way of making support available. This is in line with the conclusions from a study by Bjoernes et al. in 2012 that explored the possibilities involved in online contact between nurses and men with prostate cancer ($n = 34$).

The patients experienced a feeling of partnership in dialogue (via e-mail) that supported their ability to be active and it gave them a feeling of freedom and security. They saw the written asynchronous contact as providing a flexible and calm communication environment and as a way to substitute for the reduction in face-to-face contact at the hospital [47].

Yet an important aspect is that the new parents are depending on the fact that the nurses do check the chat every 4 hours in order to have access to support, and the study showed that it was a constant challenge. Even though the nurses thought they just had to get used to the new routine, we discussed new ways of remembering the chat, because it was critical for the parents' sense of security that they could rely on it.

The nurses in our study also found that when the face-to-face contact was reduced due to the early discharge the automated messages and the use of instructions videos were a suitable way for informing the new parents. This relates to Bandura's viewpoints on interactive computer-assisted feedback as a convenient means to inform, enable, motivate, and offer support [48]. It offers a way to reassure parents that their newborn is healthy and to help parents to feel in control of their new situation, which are factors that enhance a postnatal sense of security [12] as well as PSE [17, 18, 48] (Table 2).

Another aspect of the instruction videos is the potential of enhancing PSE through vicarious experiences, where the parents can see others perform, for instance, breastfeeding positions and bathing the child (Table 2).

The results revealed that the nurses feel the app enhances patients' curiosity and, to some extent, it encourages parents to act more independently, because they can easily search for information themselves. The nurses experienced that the new parents are more likely to seek for information themselves, when it is digitalized than in a paper pamphlet. According to Bandura, acting independently and thereby gaining one's own experience are a way of achieving mastery experiences, which strengthen PSE [18] (Table 2).

The nurses found that the automated messages serve to reassure parents, and this suggests that the messages could potentially have the effect of encouragement. According to Bandura, verbal persuasion contributes to PSE because the parents are convinced that they can cope successfully [18]. This can contribute to the achievement of a feeling of success.

Also personal messages with encouraging feedback from healthcare professionals could to some extent substitute for the verbal persuasion that the families would receive if they were admitted for a longer duration after childbirth.

Bandura also states that because it is readily accessible and convenient, there are advantages in offering internet-delivered guidance. This is reflected in our study, where the nurses point out that the asynchronous communication is essential to their view of the app as a lifeline. It is easy to seek help; the families do not encounter a barrier in contacting the nurses for advice. This is because they do not feel that they are disturbing the nurses, as opposed to making a synchronous phone call. This is described in the literature as an issue in healthcare, because patients are often reluctant to contact healthcare professionals, even when they have something important to ask or discuss [2, 49]. It seems that the app has potential to be more efficient in ensuring access to healthcare than a phone.

Other studies have tested videoconferencing in the postnatal period [23, 24, 26]; it was valued as a supplement to traditional practice. The midwives saw that communicating via videoconferencing was almost equivalent to having a face-to-face meeting. The same was found in other studies that involved videoconferencing; the healthcare professionals experienced that it is possible to create an intimate relationship and proximity in technology-mediated care and that it provides a tool for patients to develop a sense of security at home [50, 51].

The transmission of photos gives new options compared to phone-mediated contact. A photo can "say more than a 1000 words" [52], where the nurses can actually see and observe instead of both families and nurses having to rely on written or oral descriptions over the phone. Other studies have pointed out further advantages for patients in staying at home instead of going to the hospital, in terms of time saved on travelling and waiting for a consultation [53].

The use of online communication such as e-mail or text messaging involves a language-analogue mediation—it is a dialogue, but not like a dialogue that two people have face-to-face or mediated by the phone [52]. The nurses addressed that the online chat function changed their way of communicating with the families, which they experienced to change their support to the new parents. This can be explained by applying Ihde's postphenomenological theory, where he underlines that the technological mediation of human practice shapes our experiences of the situations in which we are engaged. Technology is not a neutral tool; it provides a framework and invites us to employ certain use-patterns [52, 54–56]. When communicating face-to-face or on the phone, they felt they could use more of their senses to assess the patient's expressions or voice and evaluate their emotional or mental state as when communicating online. In this situation, as compared to when conducting a written dialogue, they felt it would be more natural for them to extend the dialogue to issues other than the one initially addressed.

However a report from the Institute for Healthcare Informatics [57] on the use of social media shows that patients also use social media for emotional support, which indicates that it is no longer only through face-to-face dialogue that people feel they can get emotional support. The report concludes that there have been essential changes in the way people communicate, and as a consequence the new technologies will change how healthcare operates on a global scale [57]. This development is also underpinned by a review by Plantin and Daneback [58] that showed the majority of today's parents search for not only information, but also social support on the internet. As a result of this development and because of the reduction in face-to-face contact, it has become more common for hospital staff to both communicate online [27, 59] and offer telephone support [60] following early discharge.

The limitation of our study is that it was a small-scale study. However the participatory design process with involving the participants in the design of the technologies was valuable. We could use the concrete experiences with the use of the app in the intervention in the further design process, where there had to be adjustments to the chat function. The new adjustments mean that the nurses do not have to check the computer for new messages, but they got an iPhone, where they receive a notification, whenever there is a new message.

There is a potential to assess the app in a randomized controlled trial for a more generalizable knowledge.

The development nurse on the ward was chosen to be the comoderator. She was newly employed and had not been a part of the intervention. Yet some of the nurses at the ward were familiar with her, which could contribute to a comfortable and safe atmosphere during the interview [35, 61].

7. Conclusion

The app gives the nurses the possibility to offer support and information to the parents being early discharged, as the app is experienced as a lifeline that connects the homes of the new parents with the hospital.

The written asynchronous communication provides an easy way for the nurses to offer the new parents support, when they are being early discharged, because the parents find it easier to contact the nurses through the app than the phone. This provides access to the healthcare professionals, which is essential in order to ensure parents' postnatal sense of security.

The automated messages are a suitable way for informing the new parents and it encourages them to act independently, which can enhance parental self-efficacy because the parents are inspired to take action thereby gaining mastery experiences.

The nurses experience that the app offers an efficient way to provide information to the parents as compared to pamphlets, because the parents were more likely to seek information when it was digitalized.

The nurses generally tend to focus their actions around providing information, and they do not consider that written communication lends itself to a more open and extended dialogue. This could be a question of needing more time to adapt to this new way of communicating. With more time,

they could possibly use the asynchronous communication not only to convey information and for observation purposes, but also to offer emotional support.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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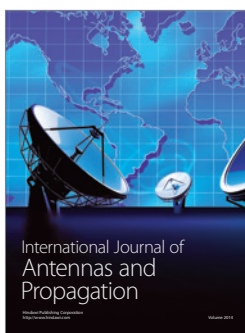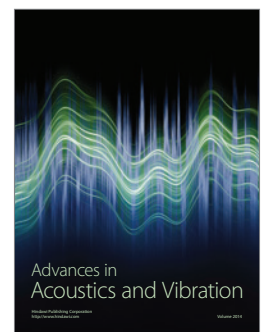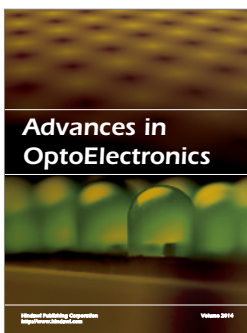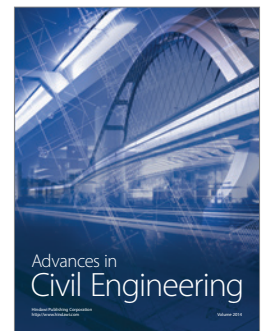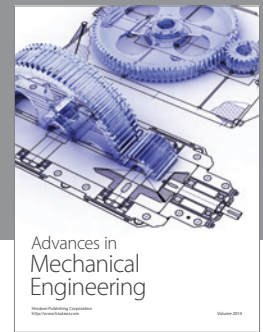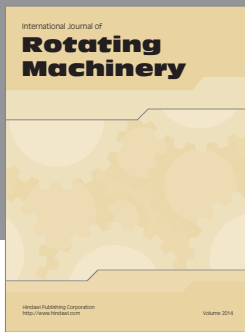
Paper V

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Title: Parental Experiences of Early Postnatal Discharge: A Meta-synthesis

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Abstract: Objective: The aim of this study was to investigate new parents' experiences of early postnatal discharge. Design: A meta-synthesis including 10 qualitative studies was conducted using Noblit and Hare's method of meta-synthesis development. Setting: Qualitative studies performed in western countries from 2003-2013 were included.Participants: The 10 included studies involved 237 mothers and fathers, first time parents as well as multiparous.Findings: We identified four overlapping and mutually dependent themes reflecting the parents' experiences of early postnatal discharge: Feeling and taking responsibility; A time of insecurity; Being together as a family; and Striving to be confident. The parents' experiences of responsibility, security and confidence in their parental role, were positively influenced by having the opportunity to be together as a family, receiving postnatal care that included both parents, having influence on time of discharge, and getting individualised and available support focused on developing and recognising the parents' own experiences of taking care of the baby. Conclusions and implications for practice: The new parents' experiences of early discharge were closely related to the initial process of becoming a parent. Yet feeling secure and confident in the parental role were influenced positively or negatively of how early discharge was organised. This underscores the importance of how health professionals support new parents when discharged early postnatal.

PARENTAL EXPERIENCES OF EARLY DISCHARGE:
A METASYNTHESIS

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Highlights

- Early discharge (ED) influences feelings of security, confidence and responsibility
- Experiences of ED are close related to the initial process of becoming a parents
- Being together as a family has an impact on feelings of security and responsibility
- Parents are supported by health professionals' individualized support
- Parental confidence depends on availability of support and recognition

Parental Experiences of Early Postnatal Discharge: A Meta-synthesis

Abstract

Objective: The aim of this study was to investigate new parents' experiences of early postnatal discharge.

Design: A meta-synthesis including 10 qualitative studies was conducted using Noblit and Hare's method of meta-synthesis development.

Setting: Qualitative studies performed in western countries from 2003-2013 were included.

Participants: The 10 included studies involved 237 mothers and fathers, first time parents as well as multiparous.

Findings: We identified four overlapping and mutually dependent themes reflecting the parents' experiences of early postnatal discharge: Feeling and taking responsibility; A time of insecurity; Being together as a family; and Striving to be confident. The parents' experiences of responsibility, security and confidence in their parental role, were positively influenced by having the opportunity to be together as a family, receiving postnatal care that included both parents, having influence on time of discharge, and getting individualised and available support focused on developing and recognising the parents' own experiences of taking care of the baby.

Conclusions and implications for practice: The new parents' experiences of early discharge were closely related to the initial process of becoming parents. Feeling secure and confident in the parental role was positively or negatively influenced by the organisation of early discharge. This underscores the importance of the way health professionals support new parents at early postnatal discharge.

Introduction

Since the 1970s there has been a steady decline in length of hospitalisation after birth in many western countries; currently, the length of stay is between 48 and 72 hours or less (Brown et al., 2002). There have been considerable controversies over the consequences of early discharge from hospital after birth (Brown et al., 2002, Bravo et al., 2011). Skeptics point out potentially negative consequences such as delays in detecting and treating maternal and infant morbidity, problems related to breastfeeding leading to early weaning, decreased maternal confidence, higher prevalence of maternal depression and increase in readmissions of mother and infant (Williams et al., 2003, Fink, 2011). Proponents of early postnatal discharge argue that it is a shift from

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medicalisation of maternity care towards a more family-centered approach. The potential consequences of early discharge include the opportunity for all family members to be together and become familiar and bond with the infant, decrease exposure to nosocomial infections and enhance maternal confidence in care for the newborn in the home environment (Brown et al., 2002, Fink, 2011).

The postnatal period is a transition characterised by mayor physical, emotional and social changes for the mother, the father, the newborn and their close relations (Stern, 1997). The ability of parents to manage this transition might impact on their future well-being and mutual relation (Howell et al., 2006). The WHO recommends that the health care system should observe the condition of mother and infant, support breastfeeding or other nutrition, monitor the growth of the infant and empower and support the parents when taking care of their infant during the neonatal period (WHO, 2013). Preparation during pregnancy and follow up after discharge –may be important factors to reach optimal health? outcomes (Brown et al., 2002).

Quantitative effect evaluations of early postnatal discharge often use rate of readmission and breastfeeding to measure the safety of early discharge (Brown et al., 2002, Askelsdottir et al., 2013). Results are possibly influenced by substantial variation in antenatal preparation, timing of early discharge and follow-up (Bravo et al., 2011). A Cochrane review from 2002, concluded that early discharge of healthy mothers and term infants apparently had no adverse effects on breastfeeding or rate of maternal depression (Brown et al., 2002).

A growing number of qualitative studies on parents' experiences of early postnatal discharge contribute with knowledge of new parents' need for support and information during the short hospitalisation and the first weeks at home (Persson and Dykes, 2002, Askelsdottir et al., 2013, Danbjorg et al., 2013). This knowledge might improve the quality of postnatal care. Despite qualitative studies providing a substantial body of knowledge, they have little impact for evidence-based practice (Hansen et al., 2011, Bondas and Hall, 2007). Thus, there is a need for a meta-synthesis reviewing current qualitative research to add more weight to the qualitative findings (Paterson and Thorne, 2003, Bondas and Hall, 2007, Facey et al., 2010). The aim of this study was to explore the experiences of early postnatal discharge among parents.

Method

The field of meta-synthesis is characterised by different approaches. These include meta-ethnography (Noblit and Hare, 1988), meta-study (Paterson BL, 2001) and qualitative research

synthesis (Sandelowski et al., 2007). Meta-ethnography is an inductive and interpretive form of knowledge synthesis with a comparative approach where studies are translated into one another (Noblit and Hare, 1988). Meta-ethnography focuses on studying findings and has an empirical approach (Hansen et al., 2011). The aim is a new, integrated and more complete interpretation of findings to offer a deeper and broader understanding than the findings in primary studies (Bondas and Hall, 2007, Hansen et al., 2011). This study uses the meta-ethnography approach. Meta-ethnography consists of seven described phases (Table 1).In practice phases may overlap, be parallel and repeated (Noblit and Hare, 1988). The presentation of this synthesis follows the ENTREQ statement, which consist of 21 items grouped into five domains: Introduction, methods and methodology, literature search and selection, appraisal and finally synthesis of findings. The aim is to enhance transparency in reporting the synthesis of qualitative research (Tong et al., 2012).

Literature search

A literature search was made in January 2014 in six databases: CINAHL, PsycINFO, PubMed, Embase, SweMed+ and Scopus. We used a block search strategy splitting the different phases of the search into blocks (Buus, 2008). We chose complex filters, which are broad and multifaceted and has been developed on the basis of librarian's experience (Faber, 2014). We used keywords as well as subject headings (Figure 1).

Inclusion criteria were primary qualitative and peer-reviewed studies describing parents' experiences of early postnatal discharge. Included studies were performed in western country cultures to ensure homogeneity and written in English, Danish, Norwegian and Swedish, in publication years from 2003 to 2013. Only studies of healthy term infants and healthy parents were included. We defined early discharge as being discharged less than 72 hours postnatally and term infant as infant being born from 37 to 42 weeks of gestation (Sundhedsstyrelsen, 2013).

The search and selection process was performed in four steps by the first two authors (Figure 2): 1) Systematic literature search; 2) Identification of potential relevant qualitative articles based on title; 3) Assessment of potential articles meeting the inclusion criteria based on the abstract and 4) Reading of full text article. The included studies are presented in Table 2.

Critical appraisal of included articles

The Critical Appraisal Instrument, QARI was used for validation of the included articles (JBI, 2011, Hannes et al., 2010). Four authors individually assessed the included material in accordance with

QARI criteria and discussed the assessments until consensus was reached. If the included study was conducted by one of the authors, this author abstained from being part of the assessment. Maximum possible QARI score was 10. A few missed a description of the researcher's influence on the research, two studies missed statements locating the researcher culturally or theoretically and one study used a few quotations that did not correspond with the analysis of data and interpretation of results. All the studies were finally included in the meta-synthesis as they generally scored high (Table 2) and contributed with important data on early postnatal discharge (Edwards et al., 2000).

Sample characteristics
Characteristics of the ten included studies appear from Table 2. The study methods used were individual interviews (n=5), focus group and individual interviews (n=4) and action research based on qualitative methods (n=1). The studies had been conducted in: Denmark (n=2), Sweden (n=4), Norway (n=1), Australia (n=2) and North America (n=1). Participants included 237 persons, involving 37 fathers, 150 mothers, and 50 with unknown gender; of these 68 were first time parents, 47 multiparous, and 122 with unknown parity.

Analysis
Four authors were involved in the analysis process. We followed the seven phases described by Noblit & Hare (Noblit and Hare, 1988) in our analysis (Table 1). We did not use computer software specific made for analysis of qualitative data. Data consisted of the Results section from the selected primary studies to get the raw data and diminish the influence of authors' interpretations. As the accounts in the primary articles were directly comparable we made a reciprocal translation (Noblit and Hare, 1988). Data was processed by coding line-by-line and writing down the key concepts for each study headed by the research question: How do parents experience early postnatal discharge? Subsequent studies were coded into pre-existing categories and new categories were created when deemed necessary. We created lists of key concepts and identified 11 categories. We translated the studies into one another by identifying areas where findings were related, yet respecting the findings of the individual studies. We integrated the categories and reached four mutually dependent and interrelated themes. We synthesised the translations by doing a compilation to arrive at a common understanding further than the single studies implied. During the analysis we followed an inductive process from the empirical data to the final themes. In the writing process we went back and forth in the analysis process and consulted the primary studies to ensure that data was not inappropriately stretched.

Findings

Parental experiences of early postnatal discharge differed and were characterised by a wealth of emotions from anxiety and insecurity to calmness and affinity. The experiences focused on the parents' feelings of coming home from the hospital, how they realised that the baby was dependent on them, how they wanted to do the best for their baby but did not know how, how they managed the challenges or were caught in their feelings of incompetence and how they experienced getting help from the health professionals. We identified four overlapping and mutually dependent themes reflecting the parents' experiences of early postnatal discharge: "Feeling and taking responsibility", "A time of insecurity", "Being together as a family", and "Striving to become confident" (Figure 3).

Feeling and taking responsibility

Feeling responsible for the baby dominated the postnatal period for all parents. Responsibility when discharged early was experienced as both positive and negative according to parents' level of confidence in taking responsibility (George, 2005, Fredriksson et al., 2003, Johansson et al., 2010). Responsibility was described as an overwhelming feeling impacting on their life situation, priorities and mutual relationship (Hjalmhult and Lomborg, 2012, Forster et al., 2008, George, 2005). "*Having a child changes everyday life completely; the focus is completely different. … Not in a negative way, they are just two different worlds*" (Hjalmhult and Lomborg, 2012).

Some parents appreciated the responsibility they got when being discharged early, although it was also frightening. They described a feeling of freedom and said the responsibility for the baby came instinctively (Fredriksson et al., 2003, Löf et al., 2006). When they experienced a positive feeling of responsibility for the baby, their feeling of security increased positively supporting their parental confidence:. "*To try and see, to believe that she (the baby) will tell me when she is uncomfortable…Try to listen to her more than to what others are saying* (Löf et al., 2006). Other parents were concerned whether they were able to carry out the mission required of them: "*I'm still a bit nervous about would I be able to do it, and my husband too, would we be able to handle it*"(George, 2005). Some parents felt the responsibility was overwhelming (Forster et al., 2008).: "*It's hard, and sometimes I don't want the responsibility. I have to think about every conclusion*"(George, 2005). Early discharge influenced the experience of responsibility, especially among parents feeling uncertain. For some of the mothers it resulted in difficulties completing tasks and organising activities (George, 2005, Hjalmhult and Lomborg, 2012): "*Scary as hell, yeah.. so it daunts me...I wouldn't say I am excited about it ...the thought of what to pack to go out and how to go out*" (Forster et al., 2008). Parents needed to feel confident before leaving the hospital (Sørensen and Hall, 2004, McLachlan et al., 2009, Forster et al., 2008).

Some of the families reported that they did not take responsibility before they came home: *"It is at home that all the questions crop up...if I had still been there (at hospital), I probably wouldn't have thought in the same way...independently* (Johansson et al., 2010). It was at home they found their own way and learned to trust the child and themselves: *"He (the baby) knows himself when he is hungry…if he cries, he gets food…he stops when he is full* (Johansson et al., 2010). Being at home it felt natural to share the responsibility for the newborn from the very beginning (Fredriksson et al., 2003, Löf et al., 2006). A father expressed: *"[…] I believe that it's necessary for them [the mother and baby] to come home for a man to feel responsibility as a father"* (Johansson et al., 2010).

A time of insecurity

Early postnatal discharge was subject to feelings of both insecurity and security. These opposing feelings were found both between parents and also within the individual parent as a kind of ambivalence. Parents enjoyed the freedom it was to go home and experienced their home as a relaxing place to be where they felt more content: *"I am familiar with everything here… I am in control in the apartment…that feels very secure"* (Johansson et al., 2010). At the same time they felt uncertain about breastfeeding, care and medical safety of the baby as well as of the mother (Johansson et al., 2010).

Insecurity was the dominant feeling among parents. It was articulated in different ways, described by words as unpredictable, uncertain, stressing, feelings of anxiety and fear, doubts, feeling alone and overwhelmed (George, 2005, Forster et al., 2008, Hjalmhult and Lomborg, 2012). Insecurity was associated with the lack of knowledge and skills experienced by the parents experienced, particularly in relation to the infant (Forster et al., 2008, George, 2005, McLachlan et al., 2009): *"We could almost not sleep at all the first night because she cried so much. We were worried and couldn't really calm down"* (Fredriksson et al., 2003). Some of the mothers felt paralysed and experienced situations where they did not know what to do (Fredriksson et al., 2003): *"There were so many times I didn't know what to do. I was afraid to do everything" (George, 2005).*

For the majority of the mothers breastfeeding was related to feelings of insecurity and they felt they struggled with it at home. They experienced physically sore and painful breasts and psychologically they felt anxious about whether the child was satisfied. Ideally they needed to be familiar with breastfeeding before hospital discharge (Forster et al., 2008, Hjalmhult and Lomborg, 2012): *"..Breastfeeding is just so important...it is almost bigger than giving birth...it is essential that it works in some way"* (Johansson et al., 2010).

Discharge before the parents felt ready made them feel pressured causing stress, anxiety and even fear and thus enhanced their feelings of insecurity (Forster et al., 2008). For some, early discharge was associated with a feeling of being forced out of the hospital (Forster et al., 2008, Sørensen and Hall, 2004): *'You are totally hormonal, you have just experienced the greatest thing in your life and then you get the question 'Are you ready to be discharged?' – It is like you don't feel welcome" (Danbjorg et al., 2013).* The stress and insecurity caused by early discharge diminished when the parents were prepared and involved in the decision of *when* to be discharged (Löf et al., 2006, George, 2005): "*…I couldn't have gone home after a few hours, … I would have been way too frightened to do that,…flexibility (is important)" (McLachlan et al., 2009).*

Security was voiced as feeling safe, content, feeling well, prepared, and confident (Lindberg et al., 2009, Löf et al., 2006, Forster et al., 2008). Security was linked to situations where the parents experienced that they could manage the infant: *"He (the baby) latched on directly. In some way it was a wonderful feeling. Oh, I am a mother now"* (Löf et al., 2006). Being confident in breastfeeding was used as a metaphor to be 'ready' to go home (Forster et al., 2008, Sørensen and Hall, 2004).

Being together as a family
Being together as a family gave parents a feeling of security (Hjalmhult and Lomborg, 2012). The parents needed the experience of fellowship within the intimate family when they welcomed their baby: "*My parents offered to come but we felt that it would be nice to be alone for a while" (Fredriksson et al., 2003).* The parents were of great mutual help and supported each other in their new roles *"You really need to be two the first weeks" (Löf et al., 2006).*

Early discharge and coming home was viewed as the opportunity for the whole family to be together right from the start: *"We became a whole family right away…"* (Fredriksson et al., 2003). They naturally got to know their baby and made their own routines: *"It was peaceful and calm at home and I found my own routine"* (Löf et al., 2006). In contrast, many parents experienced the hospital stay as primarily a time for the mother and baby to get to know each other and the father should be there for the woman and baby (Fredriksson et al., 2003). Some parents felt that the father was not really welcome and several fathers did not feel well received (Löf et al., 2006, Sørensen and Hall, 2004, Fredriksson et al., 2003): *"…They (health professionals) sort of allow for you to stay there but they assume that you weren't going to be there."*

Some parents underlined that domestic surroundings gave them a positive feeling that childbirth is natural. The feeling appeared as soon as they took a step away from the hospital: "*It felt healthy in some way…and somehow it is when you take the step from the hospital to something else*" (Fredriksson et al., 2003). In particular, several fathers experienced it as easier to rest at home in their own surroundings, they felt calmer and slept better (Johansson et al., 2010): *… To lie in my own bed, eat what I feel like…and when I want to"* (Löf et al., 2006). In contrast, some mothers reported that it was difficult to rest at home as they were the driving force in most domestic tasks (Fredriksson et al., 2003, Sørensen and Hall, 2004).

Striving to be confident

During the short hospital stay the health professionals supported the parents in their new role and strengthened their confidence (Lindberg et al., 2009, Forster et al., 2008). At home they had to rely on their own knowledge and feelings (Johansson et al., 2010, Forster et al., 2008). Becoming confident in their parental role was a matter of trial and error on one side and getting support if needed on the other side (Danbjørg et al., 2013, Fredriksson et al., 2003, Hjalmhult and Lomborg, 2012). They sought information about what was normal in childbirth, motherhood, the baby, relationship between the mother and the father, etc. and compared themselves to these norms (Hjalmhult and Lomborg, 2012). Some mothers learnt to trust themselves and the newborn through breastfeeding and described a feeling of success when the baby sucked and there was sufficient milk (Löf et al., 2006, Hjalmhult and Lomborg, 2012).

Parents turned to several sources of information, health professionals at the postnatal ward, general practitioners, health visitors and relatives. They used books and other written information to develop more confidence in taking care of the baby (Forster et al., 2008). Using the internet created ambiguous feelings as the parents were concerned about the validity of the information, although it was easily accessible (Danbjørg et al., 2013, Hjalmhult and Lomborg, 2012): *"I tried to Google using the key words 'red bottom' but I got a lot of hits that weren't related…" (Danbjørg et al., 2013).* Other parents had negative experiences of not knowing what to do and reacted by feeling paralysed (George, 2005): *"We couldn't leave the house for 8 days we were just complete and utterly shockingly overwhelmed for whatever reason I think back now. [...] everything was just anxious"* (Forster et al., 2008).

When discharged early the parents thought it was essential that they were able to get professional support whenever needed. It contributed to building their parental confidence (Lindberg et al., 2009, Löf et al., 2006, Fredriksson et al., 2003): "*The people at the well baby clinic convey*

confidence… and they are accessible; we always feel we can ask" (Hjalmhult and Lomborg, 2012).
If health professionals reassured that everything was going well, the parents experienced less
anxiety and more security and confidence (Löf et al., 2006, Forster et al., 2008, Lindberg et al.,
2009). The parents appreciated the reassurance both during formalised follow up: *"…It felt nice
that she rang. She asked a few questions that I answered and she said that sounded fine"(Löf et
al., 2006)* and in case they needed support after discharge: *"..it is all about having someone…to
talk to, who can reassure you and make you trust yourself as a parent…that we will make it…"
(Johansson et al., 2010).*

The parents needed to be considered as individuals and get answers to their individual questions
(Hjalmhult and Lomborg, 2012, Fredriksson et al., 2003, McLachlan et al., 2009): *"This is the most
important thing we'll ever do in our lives you know, so you don't want to feel like cattle" (McLachlan
et al., 2009).* Too much general information was difficult to handle and left the parents with
questions and doubts (Danbjorg et al., 2013, George, 2005): *"Too much information, from too
many sources…it gets confusing"* (George, 2005).

Discussion

The focus of this meta-synthesis was experiences of early discharge among parents. The included
studies were homogeneous concerning data collection, analysis and the closeness to data. We
paraphrased findings from the original studies to validate our findings and make our descriptions
reliable. Following the ENTREQ statement enhanced the visibility of our process. This meta-
synthesis includes only parents who were discharged before 72 hours postnatally. There might be
differences in the parents' experiences depending on how soon they were discharged. However, it
was not possible to make a distinction concerning the exact duration of hospitalisation among the
included respondents. We generally described how parents experienced early discharge, even
though the experiences of mothers and fathers might differ, though the primary studies have not
always allowed us to make this distinction. The included studies represent different cultures, but
we are aware that there is a preponderance of Nordic studies, which might influence the
generalisability to other western countries. However, the meta-synthesis identified commonalities
also between the US, Australian and the Nordic countries. In this way the meta-synthesis gave a
broader picture of the phenomenon under study and provided generalisability with stronger power
for evidence-based practice (Aagaard and Hall, 2008).

Our findings of responsibility in the parents' descriptions of early discharge have previously been
described as an overwhelming feeling (Nystrom and Ohrling, 2004, Barclay et al., 1997). Daniel

Stern describes it as "the biggest responsibility that nature requires from all animals" as it is the driving force behind our need for reproduction and survival of the species (Stern, 1997). We found that the experience of responsibility was mutually dependent on the level of confidence and security that the parents experienced in their new role. Having a positive experience of responsibility increased confidence and security and the parents thereby felt more competent in and able to enjoy the responsibility of their new role. On the other hand parents with negative experiences of responsibility became more insecure in their parental role. Empirical studies describe 'becoming a mother' as a process starting by realizing and facing the overwhelming situation and the consequences on one's life (Barclay et al., 1997, Mercer, 2004). At this stage mothers' experience of responsibility may be associated with feelings of powerlessness, maternal inadequacy, exhaustion, ambivalence, overwhelming and 'whole life has changed' (Barclay et al., 1997, Nystrom and Ohrling, 2004). The process gradually develops until the final stage of the process which encompasses 'working it out', the stage where the woman develops skills and gains confidence in being a mother (Barclay et al., 1997, Mercer, 2004). This indicates that the parents' experiences of responsibility in our study are closely related to the process of becoming a parent at different stages in this process.

We found that early discharge influenced the parents' experience of responsibility. Not being ready to be discharged seemed to trap the parents in the first developmental stages of being a parent; some were left with a feeling of responsibility that was exhausting and overwhelming. Other parents appreciated the responsibility they got by being discharged early and gradually built up their relation to the baby and their parental competences by understanding and reacting on the baby's cues. Mercer describes in her theory of becoming a mother that moving towards a new normal requires restructuring and "much restructuring occurs as she [the mother] learns her infant's cues and what is best for her infant, and adjust to her new reality"(Mercer, 2004). It might therefore be helpful if health professionals focus on supporting the new parents in understanding and reacting on their baby's cues before discharge.

In this study the parents' description of their feelings when discharged early were focused on security and insecurity, the latter being the dominant feeling. Security influenced and was influenced by several factors as being in own surroundings, being in control, being able to meet the baby's needs, being together as a family and being able to get sufficient support. Our findings are in line with Persson and Dykes, who identified four dimensions leading to sense of security (Persson and Dykes, 2002). However, we found postnatal sense of security to be one of four themes that mutually influenced each other and was closely related to the process of "becoming a

parent". Being secure in the parental role has been shown to positively support the relation between the parents and the baby (Jones and Prinz, 2005) whereas the experience of parental uncertainty might increase the risk for disturbing the relation (Phelps et al., 1998, Teti and Gelfand, 1991). This underscores the importance of support from health professionals to provide parents with a feeling of security in the early postnatal period. Our study indicates that a way to do this might be to include the parents in the decision of when to be discharged. This is supported by Persson and Dykes (Persson and Dykes, 2002) and other studies reporting that parents discharged before they were ready were more dissatisfies and had more problems related to breastfeeding and fatigue (Waldenstrom, 1989, Hildingsson and Thomas, 2007).

The parents in our study stressed the importance of being together as a family immediately after the birth. Early discharge naturally gave them this possibility and this influenced their sense of security positively. At home it felt more natural to share the responsibility and the father took an active role in the care of the baby. Persson and Dykes also describe how "affinity within the family" had an impact on sense of security (Persson and Dykes, 2002). Several studies show that a central theme in becoming a father is "searching for a role and position" and "participating in the care for his infant" (Chin et al., 2011, Persson, 2012, Asenhed et al., 2014). In our study several fathers experienced not being invited to take part by the health professionals during the hospital stay and some expressed that coming home made a positive difference in being a part of the new family and taking responsibility. This has also been found in previous studies (Ellberg et al., 2010, Persson et al., 2012). By recognising the importance of the father's role, and enhance the possibility for the family to be together it seems that the new family and especially the father benefits from early discharge to build up early parental competence. In a broader perspective increased involvement of the father has been shown to improve long-term health outcomes for themselves, their partner and their children (Goodman, 2005, WHO, 2007).

Early discharge put a mild pressure on the parents for trying to manage the baby themselves and thereby gaining experiences that might increase confidence in their parental role. This is supported by Bandura's theory of self-efficacy in which the most important source for increasing self-efficacy is mastery experiences (Bandura, 1997). Early discharge had a negative influence when the parents did not have access to individual support when needed and thereby had the opportunity to be reassured that they were doing well. Other studies have stressed the importance of individual support (Schmied et al., 2008, Yelland et al., 2007) and Persson and Dykes describes how "the midwives' empowering behaviour" contributed to the parents' sense of security (Persson and Dykes, 2002). Mercer points out that a central aspect of the support when mothers are striving to

gain maternal identity is an interactive dialogue between the health professional and the mother. This dialogue includes identification of needs and available resources in the individual mother to enhance her confidence by appraisal and informational support (Mercer, 2006). This study showed that parents' experiences of early postnatal discharge as being positive or negative impacted on the early postnatal period and seemed to depend on how early discharge was organized.

Conclusion and implications for practise

Our study points out that having the opportunity to be together as a family positively influences parents' experiences of responsibility, security and confidence in their parental role. If postnatal care includes both parents and timing of discharge is made in agreement with the parents, it gives the parents a feeling of security impacting on their parental confidence and responsibility. Individualised available support focused on developing and recognising the parents' own experiences of taking care of the baby increases their sense of security and parental confidence and gives parents a feeling of being capable of managing the responsibility for their baby. Taking responsibility for the baby, feeling secure and confident in their parental role is closely connected to the process of becoming a parent. Yet early postnatal discharge might influence the initial process positively or negatively depending on the organization of postnatal care. This underscores the importance of the way health professionals support new parents at early postnatal discharge.

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Table 1: The phases of the Meta-ethnography (Noblit&Hare, 1988)

1. Getting started
2. Deciding what is relevant to the initial interest
3. Reading the studies
4. Determining how studies are related
5. Translating the studies into one another
6. Synthesizing translations
7. Expressing the synthesis

Table 2. Included studies and their characteristics

References	Aim	Country	Method	Participants	Contribution to findings[1]				QARI score[2]
					1	2	3	4	
(Danbjorg et al., 2013)	To identify the nursing support needs of new parents and their infants during the first seven days post partum	Denmark	Participant observation, individual interviews, focus groups, workshop Systematic text condensation	19 parents, 14 mothers and 5 fathers, 10 first time parents and 9 multi pararous, 18 health professional		x		x	9
(Forster et al., 2008)	To gain a more in-depth understanding of women's views, expectations and experiences of early postnatal care	Australia	Focus groups and individual interviews Thematic network	52 parents, 50 mothers and 2 fathers, 8 pregnant and 7 first time parents	x	x		x	8
(Fredriksson et al., 2003)	To describe newparents' choice of the type of maternity care they wanted to receive, and to gain a better understanding of parents' experiences of different postnatal care alternatives.	Sweden	Semistructured individual interviews Content analysis	23 parents, 12 mothers and 11 fathers 8 first time parents,15 multiparous	x	x	x	x	9
(George, 2005)	To examine the experiences of first-time mothers following discharge from the hospital after vaginal delivery.	USA	Semistructured in-depth individual interviews Grounded Theory	10 mothers, all primiparas	x	x		x	9
(Hjalmhult and Lomborg, 2012)	To present a theoretical account of mothers' first period at home with their newborn in Norway.	Norway	Focus groups with semistructured interview guide Grounded Theory	26 mothers, 10 first time and 16 multiparous	x	x	x	x	7
(Johansson et al., 2010)	To gain a deeper understanding of first-time parents' experiences of early discharge from hospital after delivery and home-based postnatal care.	Sweden	Focus groups, couple and individual interviews Content analysis	21 parents – all first time parents 11 mothers, 10 fathers	x	x	x	x	8

Reference	Aim	Country	Method	Sample	1	2	3	4	Score[2]
(Lindberg et al., 2009)	To describe parents' experiences of using videoconferencing (VC) when discharged early from a maternity unit.	Sweden	Semistructured individual interviews via Video-conferences Content analysis	18 parents (9 couples)		x		x	9
(Löf et al., 2006)	To describe factors that influenced first-time mothers' choice of and experiences during the first postnatal week, after early discharge without a domiciliary visit by the midwife.	Sweden	Individual interviews Content analysis	9 mothers, first time mothers	x	x	x	x	9
(McLachlan et al., 2009)	To explore the views of women and their partners regarding a number of theoretical postnatal care 'packages' that could provide an alternative approach to early postnatal care.	Australia	Focus groups Individual interviews Thematic network	52 participants – 8 pregnant (7 first time), 42 mothers, 2 fathers	x	x		x	9
(Sørensen and Hall, 2004)	To investigate multiparous women's resources, expectations and experiences around childbirth.	Denmark	Semistructured individual interviews Content analysis	7 mothers, multiparous	x	x	x		9

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[1] Contributes to the found themes: 1=Feeling and taking responsibility, 2=A time of insecurity, 3=Being together as a family, 4=Striving to become confident

[2] Maximum possible score = 10

Figure 1: Search strategy with example of the qualitative filter

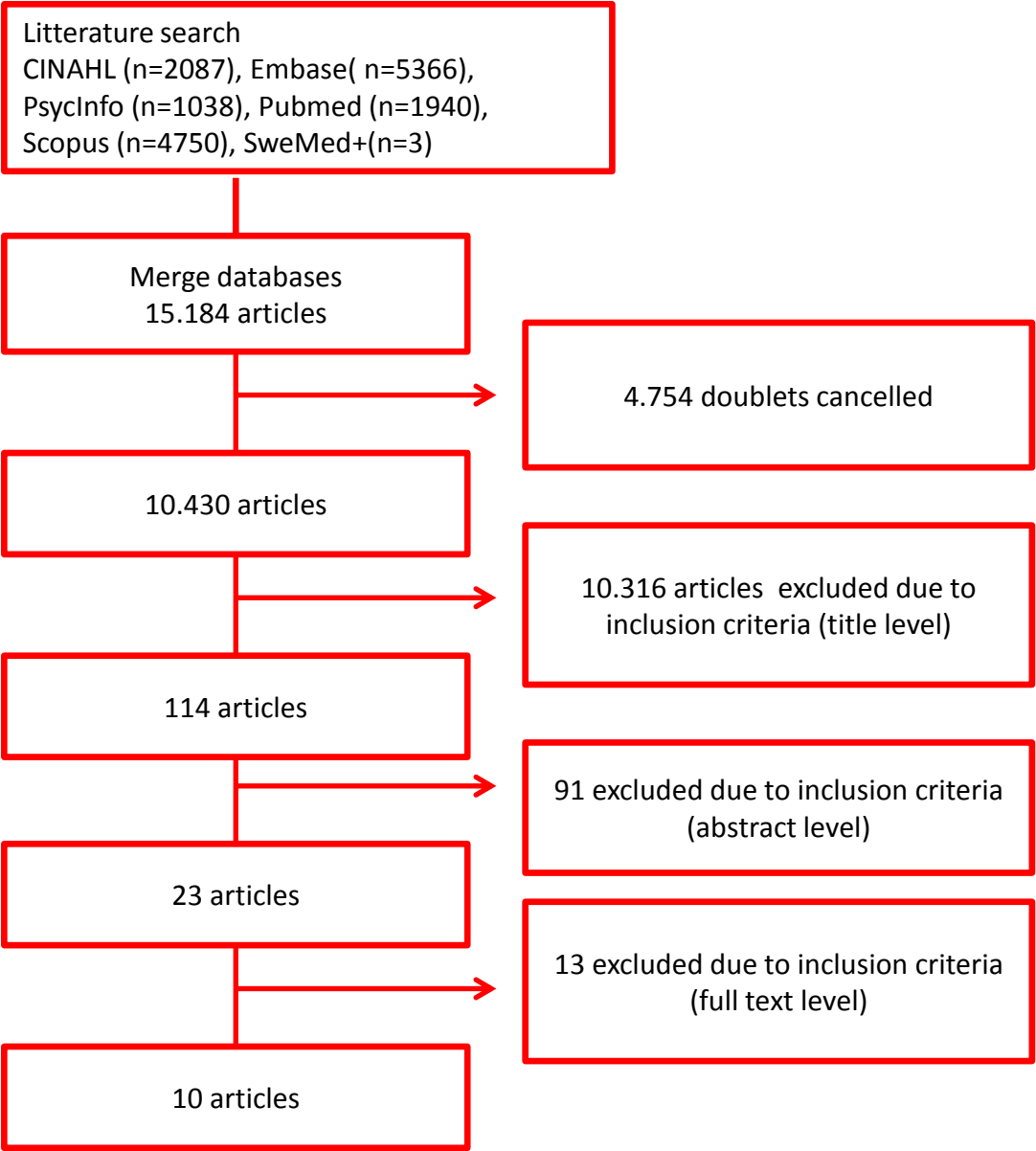| Postnatal	AND	Early discharge	AND	Qualitative filters applied in PubMed (Faber, 2014)
postpartum postnatal puerperium perinatal postpartum care postnatal care perinatal care breast feeding newborn infant		discharge discharged early reduced short shortened ambulatory outpatient		((("semi-structured"[TIAB] OR semistructured[TIAB] OR unstructured[TIAB] OR informal[TIAB] OR "in-depth"[TIAB] OR indepth[TIAB] OR "face-to-face"[TIAB] OR structured[TIAB] OR guide[TIAB] OR guides[TIAB]) AND (interview*[TIAB] OR discussion*[TIAB] OR questionnaire*[TIAB])) OR ("focus group"[TIAB] OR "focus groups"[TIAB] OR qualitative[TIAB] OR ethnograph*[TIAB] OR fieldwork[TIAB] OR "field work"[TIAB] OR "key informant"[TIAB])) OR "interviews as topic"[Mesh] OR "focus groups"[Mesh] OR narration[Mesh] OR qualitative research[Mesh] OR "personal narratives as topic"[Mesh]

Figure 2: Selection of studies

Figure 3: The four overlapping and mutual dependent themes

Feeling and taking responsibility

Being together as a family

A time of insecurity

Striving to be confident as a new parent