

Original Article

The knowledge and learning needs of health professionals in providing support for parents of premature babies at home: A mixed-methods study

Julia Petty^{a,*}, Lisa Whiting^a, Alison Mosenthal^a, Cathrine Fowler^b, Doug Elliott^b, Janet Green¹^a University of Hertfordshire, Hatfield, Hertfordshire, England, AL109AB, United Kingdom^b University of Technology, Sydney, Australia

ARTICLE INFO

Keywords:

Community neonatal care

Prematurity

Health professional knowledge

Parental support

ABSTRACT

Premature babies and their families often require on-going community-based care after discharge from the neonatal unit. Parents themselves have identified the need for health professionals to understand the specific needs of parents of premature babies in order to provide the optimal support they require. This study aimed to explore the existing knowledge base and learning needs of community health professionals, to further understand how they can adequately support parents in the community with premature babies. A mixed-methods approach was used comprising a questionnaire, semi-structured interviews and secondary data analysis. Participants included thirteen Health Visitor [HV] students, eight educators and seven parents from a previous study. Thematic analysis revealed important insights into the knowledge and learning needs necessary to support parents of premature babies in the community. Three main themes emerged: development of prior knowledge; the importance of practice-based learning; learning and training needs. Knowledge, confidence and skills in relation to caring for parents with premature babies varied between individuals depending on their placement during training and subsequent experiences. While transferable skills in supporting parents in the community were present, more education and training in the specific needs of premature babies and parents would be welcomed. Tailored resources for community-based health professionals on the specific needs of the premature baby would enhance provision of optimal support for parents.

1. Introduction

This paper reports on a mixed-methods study that aimed to explore the knowledge base and learning needs of community-based health professionals relating to supporting parents of premature babies. Many premature babies have on-going home-based care requiring clinical and support services (Boyle et al., 2011; Boykova and Kenner, 2012; Smith et al., 2009). When parents and babies leave neonatal hospital care, community-based health professionals, comprising Health Visitors [HV] and outreach nurses provide much of this continuing care and support to varying degrees. One key finding from a recent study (Petty et al., 2018) that explored the experiences of parents with extremely premature babies at home, highlighted the need for community-based health professionals to have greater understanding of the specific needs of parents with premature babies in order to provide the optimal support they require. Importantly, the findings identified that the different developmental trajectories of these babies are not fully understood by

many community-based professionals who usually care for well, term infants – this lack of knowledge can cause feelings of stress and isolation for parents and may result in the parent(s) of babies seeking advice from paediatric hospital services unnecessarily.

The finding that additional parental emotional stress required increased support from community-based professionals, is supported by Burnham et al. (2013) who described the perceived lack of community clinicians' knowledge about premature babies and how neonatal nursing support was crucial for building confidence in parental care. Unfortunately, the current limited opportunities for clinicians to learn about what mothers expect can restrict their ability to effectively support them (Pridham et al., 2006).

2. Background

As survival rates of premature babies have increased, provision of care and support in the home environment has become crucial.

* Corresponding author.

E-mail addresses: j.petty@herts.ac.uk (J. Petty), l.whiting@herts.ac.uk (L. Whiting), a.mosenthal2@herts.ac.uk (A. Mosenthal), cathrine.fowler@uts.edu.au (C. Fowler), Doug.Elliott@uts.edu.au (D. Elliott), jgr54354@gmail.com (J. Green).¹ Independent Researcher.<https://doi.org/10.1016/j.jnn.2019.07.002>

Received 1 April 2019; Received in revised form 17 June 2019; Accepted 2 July 2019

Available online 07 August 2019

1355-1841/ © 2019 The Authors. Published by Elsevier Ltd on behalf of Neonatal Nurses Association. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

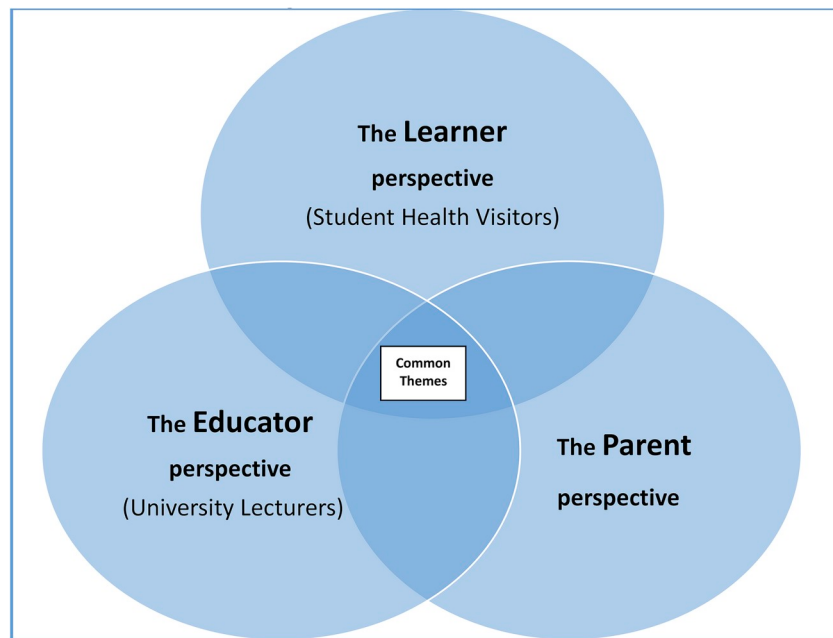


Fig. 1. Tripartite perspective.

Community-focused education programmes need to reflect this phenomena of a ‘new’ group of babies; however, evidence is lacking that this is currently the case. Some authors, for example, have discussed HV education without mention of the needs of premature babies and their parents (Appleton et al., 2014; Condon et al., 2015).

In addition, limited research exists on health professionals’ knowledge base and learning needs relating to caring for premature babies in the community setting. What does exist focuses mainly on *medical practitioner’s* knowledge specifically; for example, as Hobbs et al. (2015) state, information is lacking about the challenges paediatricians face when caring for such vulnerable babies, even after a well-organised discharge home. They believe that the knowledge needs of paediatricians are rarely considered. Boss and Hobbs (2013) also refer to the training of medics, stating that some may feel unable to care for medically complex babies. This may be due to the perceived lack of training in developmental paediatrics and specific care issues (Kuppala et al., 2012).

In addition, a survey of general paediatricians found that many believed they did not adequately integrate medical care with the plans of other services or with families’ needs (Gupta et al., 2004). To concur more recently, Powell et al. (2012) found that some 50% of obstetric professionals reported they struggled to answer parental questions regarding their premature infants. Parker et al. (2012) found that medical residents were unaware of the magnitude of stress and anxiety experienced by parents of premature babies following discharge and were subsequently ill-equipped to support parents through the transition home. Indeed, Einaudi et al. (2013) examined the knowledge of physicians involved in the management of children born extremely preterm who expressed a need for information on methods of assessment to inform care.

Recent literature however, on *nursing* knowledge relating to community-based care for premature babies and families is sparse. Blanco et al. (2005) reported that doctors, nurses and nurse practitioners underestimated survival rates and overestimated long-term disability rates for very premature infants; in other words, their knowledge was not always completely accurate requiring educational intervention. A more recent paper by Cordewener and Lubbe (2017) described nurses’ perceptions of skills required to perform effective preterm baby assessments. Thirteen semi structured interviews were conducted, and the themes identified included a lack of skills and knowledge to conduct

quality assessments. Formal and continuous development training needs in this area were also highlighted.

Finally, a paper on HV training in the UK acknowledged that a wide range of knowledge, skills, and abilities were required (Malone et al., 2016) although the area of prematurity was not mentioned. Other papers on the importance of neonatal specific education (Turrill, 2014; Spence et al., 2016) focus more on clinically based care rather than ongoing care of parents within the community setting.

Clearly however, knowledge acquisition and training in caring for parents of premature babies is important, given what parents have reported in previous research in relation to the lack of specific knowledge on prematurity (Petty et al., 2018; Fowler et al., 2019). The gaps in this existing evidence base supported by the parent participants reported in these papers, suggests that consideration of educational needs of health professionals is imperative. This is particularly important given the high value parents place on their relationship with professionals for ongoing support (Garcia and Gephart, 2013). Therefore, the current study aimed to explore health professionals’ knowledge and learning needs relating to the care and support required by parents of premature babies at home, to inform future education.

The specific objectives were to:

- Gain insight into what community-based health professionals already know, and what they need to know in relation to the specific needs of parents with premature babies following discharge home from a neonatal unit.
- Identify the learning requirements that will enable community-based health professionals to provide appropriate support to parents of premature babies within a home environment.

The study aimed to address these two objectives using a tripartite approach, exploring the perspectives of three key groups: health visitor *learners*, *educators* and *parents* of premature babies (See Fig. 1).

3. Methods

Within the context of the above background literature, the research question was:

- What is the existing knowledge base and learning needs of

community health professionals in relation to the care and support required by parents of premature babies at home?

3.1. Design

The study was designed using a mixed methods approach comprising a questionnaire, interviews and secondary interview analysis. This type of approach uses a combination of methods and both quantitative and qualitative analysis in a single study (Creswell and Plano Clark, 2007). It is commonly used by health researchers as it has the potential to utilise the strengths and offset the weaknesses of both types of analysis and can be especially powerful when addressing complex issues; in this case, knowledge and learning relating to the human experience. While Tariq and Woodman (2013) acknowledge that a key challenge is the successful integration of quantitative and qualitative data during analysis and interpretation, different types of data can generate varying insights into a research question. This can result in a more enriched understanding of the phenomena in question, as was the intention behind this study's methodological approach.

3.2. Participants

Regarding gaining the perspectives of learners, educators and parents, the study participants comprised: a group of thirteen HV students, eight University lecturers with either HV, community children's nursing or midwifery backgrounds, and seven parents of premature babies. Convenience sampling (also known as availability sampling) was employed, a type of non-random sampling where members of a target group meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate (Etikan et al., 2016). This form of sampling is associated with potential bias which will be addressed later.

All participants were accessed by requesting volunteers through a key gatekeeper who disseminated the recruitment call to both students and lecturers, using an established email contact database. Once volunteers came forward, the gatekeeper's role was to forward their details to the authors to contact them. The voluntary approach meant the researchers were not in control of the specific characteristics of those who came forward, such as age, gender or ethnicity, nor the number who would offer to participate. The decision was made between the authors to continue recruitment until they had agreed that sufficient data had been collected enabling an equitable balance of information from each of the three areas until data saturation had been reached. All participants were given a participant information sheet explaining the study and that their data would be used for informing future practice.

As well as written information, informed consent was confirmed prior to all the interviews enabling further verbal clarification of queries before the interview. Implied consent was given by the participants who agreed to complete the questionnaire. The questionnaire comprised 30 items including a combination of both Likert scale quantitative responses and qualitative, open answers on a variety of areas: namely, previous experience and training, current role and knowledge and learning needs in relation to caring for premature babies and their families. The questions were devised collaboratively within the research team, informed by the aforementioned study that identified specific areas to address in relation to knowledge base and learning of community health professionals (Petty et al., 2018).

All interviews were audio-recorded digitally and transcribed. Details of each of the three groups of participants along with the specific methods and analysis used with each group are outlined below.

Students: Classroom-based completion of the questionnaire with thirteen HV students and subsequent telephone interviews with five of them were held towards the conclusion of their programme. These participants were female, aged between ranges 21–25 and 46 + years old. Eleven were white-British, one White-Irish and one within the black and minority ethnic group (BAME). Their professions prior to

undertaking HV training varied comprising one midwife, two children's nurses and the remainder registered general nurses as did the number of years' experience working with premature babies (range 0–3 years up to 10 +). HV students rather than practicing HVs were included due to the size of the study and time-scale available as well as ethical restrictions relating to accessing practice staff. To include trained HVs as a potential focus of future work is highlighted later. The five students who were interviewed volunteered to do so following completion of their questionnaire, to add further perspectives to the quantitative data, expand on their responses and enrich the data. These interviews were conducted, via telephone, by one of the authors (LW) in a private office on University premises and lasted for between twenty one and thirty one minutes. LW also analysed the transcripts using thematic analysis as described below.

Educators: Face-to-face interviews were conducted by one of the authors (JP) with eight lecturers based at the author's University who were teaching on the post-graduate HV and/or community children's nursing programme or the midwifery (MW) under-graduate programme. These participants were all female, six were white-British and two were from a BAME background, with age not recorded. Six had over ten years' experience with the remaining two within 0–3 and 5–10 year ranges. As a range of community perspectives was sought, four educators taught on the HV/community nursing programme and four were midwifery lecturers. The decision to include MW lecturers was made following recommendations from the HV lecturers. While midwives are less likely to be involved with families for a long period post-discharge, they still play a key role in initial parent support. The interviews took place on University premises and lasted for between 30 and 50 minutes. Analysis was undertaken by the third author (AM).

Parents: Seven parents interviewed for a previous study that explored the emotional experiences of having a premature baby (Petty et al., 2019) consented to allow their transcripts to be used for secondary analysis. These participants were female, five were aged between 36 and 40 and two aged between 41 and 45 years. Six were white-British and one white-French. The age range of five of the children at the time of the parent interviews was 1–5 years with two being 6 years old. Three were female, four male and all were born before 30 weeks gestation. The analysis related to previous interview content where parents had commented on health professional knowledge and support in the community.

3.3. Ethical considerations

The study design and procedures were approved by the authors' Higher Education Institute [HEI] Ethics Committee; Protocol number: HSK/SF/UH/03364. The ethical approval overall included guarantees that all participants would give informed consent prior to any interview and that all participant data would be anonymised and securely stored in line with confidentiality and current data protection regulations. Informed consent was also required for the interviews to be recorded. The approval also included permission to use parental data from a previous study for secondary analysis, following further consent from said parents. Finally, the ethics application gave assurances that interviews would be stopped if any emotional distress was experienced by any of the participants.

3.4. Analysis

It is important that the data analysis is suited to mixed methods. The approach taken was to analyse the qualitative and quantitative data sets separately and to compare, contrast and combine the findings for reporting (O'Cathain et al., 2010). Moreover, data should be analysed using techniques usually associated with that type of data. In this case, descriptive analysis was used to analyse the questionnaire whilst thematic analysis was used to analyse the interview data. In this approach, the integrity of each data set is maintained whilst also benefiting from

an enhanced understanding from combining the findings.

Thematic analysis as proposed by Braun and Clarke (2014) was chosen for the qualitative data which involved familiarisation with the transcripts, reading and noting down initial ideas followed by coding of identified themes, culminating in a final review and categorisation of main themes for naming and reporting. Due to its flexible approach that can be modified for the needs of many studies, thematic analysis can offer rich and detailed analysis of data (King, 2004). Key themes and sub themes were identified by this approach.

Transcripts were all read by the first three authors and the analysis was carried out by all three who ensured that they agreed and reviewed each other's data interpretation throughout the whole study. They also met regularly to verify the emerging themes. This approach is reported as being important to optimise trustworthiness and rigour of narrative data within qualitative research (Nowell et al., 2017; Rolfe, 2006). Limitations of the study also required consideration and are outlined later within the Discussion.

4. Results

The results of the analysis yielded a range of valuable findings which will now be summarised. Regarding qualitative data from both the interviews and questionnaires, three main themes emerged from the thematic analysis: development of prior knowledge; the importance of practice-based learning; learning and training needs. These are outlined in Table 1. Interestingly, these themes were common to all participant groups and are reported here according to the three perspectives: students, lecturers and parents, highlighting selected quotes to illustrate key points for each theme (Boxes 1, 2 and 3: labelled with 'Student', 'Lecturer' and 'Parent').

4.1. Theme 1; development of prior knowledge (Box 1)

The learner perspective; Firstly, the type and length of experience prior to the HV programme did have some impact on knowledge and confidence. More knowledge was evident for those with prior children's nurse training. Overall however, minimal education was identified for most respondents, on the specific needs of the premature baby and family. The main focus was on growth monitoring rather than any other area and all but one HV students had had less than two weeks of education in prematurity including four with no training and four having a day or less. The respondent who had over two weeks experience was a midwife, and this was a neonatal placement during her pre-registration programme. Frequency of contact with premature babies and families ranged from daily ($n = 1$), weekly ($n = 5$) and one to three monthly ($n = 7$); this limited the development of knowledge for some due to minimal exposure to this specific group.

Interview findings confirmed that there was not a specific focus on prematurity in the HV programme and it was felt that more content would have been beneficial. However, it was recognised that the programme was already very full; a range of transferable knowledge had been acquired by the HV students and this formed a good building block for future professional development. Interestingly, the number of premature babies, and their families, that the HV students came into contact with was very small – perhaps illustrating the context that prematurity takes within the HV programme. Overall, for many students, knowledge and confidence in the specific needs of and the support of parents of premature babies was not felt to be sufficient.

The educator perspective; In general, all lecturer groups acknowledged that care of the premature baby was not provided as a specific component of the curriculum although this was being addressed within the midwifery course with the introduction of a new curriculum/module where it was envisaged that prematurity would be covered in more depth along with a practice placement within the neonatal unit. All lecturers commented that experience gained in practice depended on the caseload of the assigned supervisor so that some students gained more experience than others. However, all groups of lecturers also felt that skills acquired on the courses were transferable and that by the end of the programme students should have sufficient ability to support parents and signpost them to relevant support services as required.

The parent perspective; The previously cited studies (Petty et al., 2018, 2019) that explored parents' experiences found that parents in general voiced very positive opinions on the support they received from health professionals during their neonatal care trajectory. However, parents also highlighted instances when they felt that in the community setting specifically, knowledge of health professionals was at times lacking and there did not always appear to be an understanding of the specific support needs required by parents at home. In the study from which the original data was used for secondary analysis (Petty et al., 2019), this was an incidental finding and given that parents were not specifically asked about this, it was interesting that this theme emerged frequently.

4.2. Theme 2: importance of practice experience (Box 2)

The learner perspective; In terms of current knowledge, there is a clear focus on practice experience being the most common way that sources of information are gathered to impart to parents. All thirteen questionnaire respondents chose workplace/practice as a previous and current source of knowledge. Learning from practice staff and the multi-disciplinary team ($n = 5$) as well as charities such as BLISS Baby charity (<https://www.bliss.org.uk/>) ($n = 7$) was also raised several times in conjunction with practice learning. Practice based learning was variable depending on how much exposure students received to premature

Table 1
Themes and sub-themes.

Theme	Sub-theme/detail	Supporting information
Development of prior knowledge	● Knowledge base/What is already known - o How that knowledge was acquired - the curriculum content of community-based education programmes, staff/students building on transferable skills. - o Current level of knowledge and confidence.	61% (8/13) thought their knowledge base was adequate in terms of the physical needs of the premature baby and 85% (11/13) had good knowledge in supporting parents of well, term babies. However, 61% (8/13) did not feel they had adequate confidence to support parents of premature babies.
The importance of practice	● Current sources of knowledge - o The vital role of practice-based learning. - o Learning from current experience. - o Learning from each other. - o Being proactive.	92% (12/13) had two weeks or less of formal education, and 46% (6/13) identified the best way to deliver training was post-qualification and 'on the job' experience (46% 6/13).
Learning and training needs	● What knowledge is needed - o Knowledge about the support that is required by parents. - o The need for specific guidance and resources for staff/students to use to inform practice and support parents. - o Training and education required by staff/students to guide them in supporting parents.	85% (12/13) answered 'Yes' to being asked if they needed more training in the specific needs of supporting parents with premature babies. 92% (12/13) identified they needed more knowledge to equip them to support these parents and 69% (9/13) said they needed greater confidence to do so.

Box 1**Theme 1: Development of prior knowledge.**

“There's only so many lectures in a day ... So, I appreciate they need to work out what needs to be in and what doesn't.” (Student)

“I think in terms of caring skills and active listening all those sorts of things are transferable, definitely. I wouldn't say I'd necessarily be the most confident in giving advice and information about specific issues [to do with prematurity]” (Student)

“I would be OK with term babies But I don't feel I have sufficient knowledge or training to really advise parents of premature babies” (Student)

“we don't focus specifically on prematurity as such. We look at child development and ... there will be information regarding what to look for ... but specific to prematurity there isn't anything in the module that focuses directly on that (HV Lecturer)

“... in the third year it's emergencies in childbirth but specifically maternal emergencies with some on the midwife's role in preterm birth ... liaising with the multidisciplinary team ... but not about the specific needs to premature babies later necessarily (Midwifery Lecturer)

“I think there's a real lack of understanding about premature babies” (Parent)

“Staff in the community did not always know how to advise me about my premature baby they are different” (Parent)

babies and their families. Much of the experience gained was regarding supporting parents with feeding and growth/weight – from a normal development perspective. Again, to supplement practice experience, students were very proactive in seeking relevant information and taking advantage of learning opportunities.

The educator perspective; In both the community children's nursing and midwifery courses, lecturers indicated that students gained experience, via their practice supervisor, of caring for the premature baby and supporting their parents, if they were in practice when a premature baby was discharged home to the community. Much value and emphasis were placed on the practice teacher as a source of information and guidance which students greatly appreciated. Exploring the perspectives of this group of educators would be of value for potential future research.

The parent perspective; As stated previously, most parents whose narratives were analysed expressed concerns that community health professionals had limited experience in the specific care needs of premature babies. Two of the parents commented that HVs, for example, were open and honest about their limited experience in this area and so needed to refer the parents onto other professionals, such as the neonatal unit staff within the hospital, for advice when it was required.

4.3. Theme 3: learning and training needs (Box 3)

The learner perspective; Many HV students acknowledged their awareness and a sound knowledge base in supporting parents of well, term babies (n = 7 agreed; n = 4 neutral) and in the physical needs of premature babies (n = 8). However, most of them identified a need for greater breadth of training, experience and knowledge in supporting parents specifically in relation to prematurity (n = 11). This is

congruent with views expressed by parents in the original research (Petty et al., 2018; Fowler et al., 2019). The need to support parents emotionally was very clearly expressed but there was a perceived lack of experience and knowledge in how to support this specific group of parents in this way (n = 12). Confidence levels in effectively supporting parents of premature babies for some was also limited (n = 8). The most frequent areas highlighted by student participants in relation to training, knowledge and resources were: Feeding and dietary weaning, growth and development, adjustment of milestones, infection control, expected norms of the premature baby, recognising signs of babies becoming unwell, how to emotionally support parents of premature babies and the availability of peer support groups and counselling services. Certainly, the need for sign-posting to key support networks and resources was identified and the importance of peer groups emphasised within both questionnaire and interview data. Students identified that a range of information formats would be welcomed such as written guidance (n = 8), web-based resources (n = 8) and yearly updates in practice (n = 11). However, barriers to learning were also recognised such as lack of time (n = 11), cost (n = 10), lack of support from the workplace (n = 8) and limited education in this area (n = 11).

The educator perspective; There was a consensus amongst the lecturers that students completing any of their courses would have developed sufficient skills to enable them to support a parent of a premature baby, despite not having specific theoretical sessions on prematurity or having specific allocated practice experience to a neonatal unit. Lecturers considered that students would have developed transferable skills and would be able to direct parents to relevant services that might be required. The lecturers saw the importance of signposting, not only for their students but for parents; they also expressed the need for guidance in focused areas such as feeding, growth

Box 2**Theme 2: Importance of practice experience.**

“you're able to provide better care to parents if you understand more about what they've been through from practice” (Student)

“More practical things I've learnt through the Trust that I work with I trained with a mentor and the babies were late prematurity, so 35, 36 weeks.” (Student)

“I have not had enough experience in premature babies and so I go and find out information myself” (Student)

“most students are with a qualified practice teacher so if they are with a practice teacher who has prematurity then obviously they'll be enhanced whereas somebody else who is not exposed to it won't be” (HV Lecturer)

“At the moment they don't get a huge amount of exposure to preterm babies because they are generally in transition or they are in the special care unit” (Midwifery Lecturer)

“My baby was smaller ... different in that he behaved less mature that wasn't recognised at times I felt ... staff needed more experience with this” (Parent)

Box 3

Theme 3: Learning and training needs.

"Would be beneficial to have a tailored package to provide to these parents that recognises their specific needs" (Student)

"Would like to be able to provide better, more specific support regarding feeding for example and emotional side of things" (Student)

"[They need to ...] know who and when to refer to. Health Visiting is very much a signposting service" (HV Lecturer)

"in terms of knowing who and when to signpost to, a lot will depend on the age of discharge. a baby that's been born at 28 weeks and then is sent home then they've got very different needs to a baby who was born at 36 weeks ... " (Midwifery Lecturer)

"Our Health visitor was so supportive and understanding ... and she would go and find out about my specific questions and worries about feeding him and his weight, and get back to me" (Parent)

"Community staff are lovely but they need to have more training in how different premature babies are ... they are not the same as term ones " This would help us" (Parent)

expectations, recognising the signs of a premature baby who becomes unwell and emotional support for families.

The parent perspective; Similarities were revealed between parents' views of what knowledge was required by health professionals and those of the students and lecturers. Again, most of the parents expressed value in seeing community health professionals at home, speaking highly of staff generally. However, that said, they commented that they would benefit from more knowledge in the different physical and emotional support needs relating to prematurity. Parents also felt, for example, that they would have liked clearer signposting to tailored support and/or peer groups, charities and resources to assist them both practically and emotionally in caring for a small, vulnerable child.

5. Discussion

Findings highlight various points for discussion and further exploration. Overall, while knowledge and confidence in supporting parents was *generally* deemed to be sufficient by the HV student participants in relation to the well and healthy baby, this was not the case in relation to their knowledge of prematurity (Box 1). This highlights that there is a clear need for further training and/or resources for community health professionals in terms of the *specific* support needs of parents with premature babies. Training in this area was identified as being limited but at the same time, the students understood the reasons for this and spoke very positively about their HV education.

One such reason for minimal content on prematurity is the limited time to receive formal education on this topic (identified in this study as less than two weeks). In the under-graduate midwifery programmes of the HEI where our research took place, teaching in areas such as care of the *mother* who gives birth early, and care of the neonate, is included. While this content focuses on early support rather than ongoing care after discharge, it is positive that there is some inclusion. However, this is not necessarily the case for HV and community children's nursing programmes for unavoidable reasons - *Malone et al. (2016)* explain this in relation to HV programmes in the UK; with a wide range of health-related knowledge, skills and abilities requiring development, it means that this, even without specialist neonatal input, makes it difficult to deliver within a programme lasting less than a year. Development of knowledge and skills are therefore often facilitated" through ad hoc post-registration education and training" (p.175).

Consequently, such learning is commonly acquired in practice, which was emphasised in the current study with the importance of practice-based learning being a key theme (Box 2), common across most students and educators. The questionnaire analysis, for example, highlighted that post-qualification experience, combined with specific resources, was the most effective way to develop basic knowledge that had been acquired during pre-registration programmes, with all respondents identifying 'on-the-job' experience, clinical based education

and/or practice teaching as the methods used. While it must be recognised that the ad hoc nature of exposure to prematurity can lead to variations in levels of experience, the value students place on practice learning is substantive with the support from mentors, senior HVs or community nurses being highlighted as being fundamentally important.

Also seen, was that the HV students commonly cared for a wide range of challenging groups (including premature babies). However, most of those cared for were healthy infants and their parents - overall, participants felt they were able to support these families. Transferable skills such as providing emotional support to new parents and effective communication, are a key issue. There was a general view that support skills could be *applied* to families of premature babies - this is an important factor bearing in mind the current restrictions in terms of adding more content into an already very full and busy curriculum.

In relation to this transferable ability to care for families at home, parents spoke highly of staff as a means of support, as seen in Box 3. However, they acknowledged that they were not always equipped to advise them on the nuanced needs relating to having a premature baby, due to their lack of experience. This was congruent with students' perceptions of their own training -they generally viewed their HV programme in a positive way and the abovementioned educational restrictions were understood. While students were proactive in their self-directed learning, they still recognised the need for more training in relation to the specific needs of the premature baby and family with eleven out of the thirteen responding 'Yes' to the question about this (one being unsure and only one saying 'No').

This said and given that pre and/or post registration programmes may not be able to accommodate all specialist areas in depth, there remains a need for resources to support and enhance formal education in the specific area of prematurity. One vital type of resource is the provision of sign-posting for both staff and parents, as highlighted in this study. All participant groups referred to the importance of support and/or peer groups or other services that could offer practical and/or emotional assistance. As *Burns et al. (2017)* state below:

"it may be beneficial to facilitate access to existing community resources and engagement activities through the process of linking individuals to services. These linking activities could include signposting, referral or facilitation to engage with services or activities beyond traditional health services" (p.2).

There may also be a need for *specific* information in certain subjects, for example, in relation to discharge from the neonatal unit. As *Hobbs et al. (2015)* propose, effective discharge planning for premature babies and their families requires knowledge of available community resources, an understanding of family capability and coordination with local primary care practices. To concur *Boss and Hobbs (2013)* state: "As health care providers we have the least control over a family's home environment, but we are in a position to learn about and engage relevant

resources" (pg. 32). The importance of tailored knowledge and skills as well as confidence to optimise the support to families is clearly emphasised and highlights the implications for practice.

5.1. Limitations

Before turning to final implications, it is important to highlight the study limitations in order to ensure transparency and rigour. The thematic analysis was undertaken within the qualitative paradigm where criticism may arise relating to subjective data and interpreted meanings. However, work such as this does not aim to generalise; rather the intention is to understand individual experiences or views. In addition, strategies to optimise trustworthiness of the data were employed such as joint verification within the research team, of both the interview data and the generation of themes.

The mixed-methods approach contributed to triangulation; to reiterate, the use of more than one approach to researching a question increases confidence in the findings (Heale and Forbes, 2013). Taking a reflexive approach to ensure transparency of data analysis and reporting is also a vital part of qualitative research (Landy et al., 2016). This included ensuring that the 'insider' role of the researchers was considered when interviewing their own colleagues. This did not apply to the student interviews as these participants were not known to the researchers.

Regarding the nature of recruitment, ability to control the characteristics of those who came forward was limited due to the sampling being on a convenience and volunteer basis; however, the use of a 'gatekeeper' ensured objectivity and eliminated researcher bias in this respect. This type of recruitment can limit the range of participants in areas such as gender and ethnic groups. Most participants in this study, across all three groups were a range of ages, but were white, Caucasian and female and so were not representative of different backgrounds. In addition, the study was small-scale and so caution needs to be taken when applying the findings.

Further exploration of views on a larger scale, including more diverse gender, cultural and ethnic backgrounds may be useful to embrace a broader perspective on this topic. In addition, due to the importance placed on practice education, inclusion of those within practice roles such as qualified HVs, practice teachers and mentors would be of interest for future work as these groups could have a different understanding of the needs of prematurity.

5.2. Implications for practice

The need for tailored resources focussed on prematurity and associated parental support is highlighted for future post-qualification education. Specific areas where knowledge could be developed, to better equip staff to support parents of premature babies, were identified from the questionnaire data analysis and included: Feeding, growth and development, expected norms of the premature baby, recognising signs of concern, availability of peer support groups as well as counselling services. Resource development in these areas could be useful for community-based health professionals so that they can both identify parents who require additional information and support and also to appropriately sign-post parents to support services and groups.

This study identified that HV students' preferred method of education was a combination of written and web-based information with updates within practice. This is supported by the literature; Blanco et al. (2005), for example, reported on the use of pocket-sized cards that summarised information on long-term outcomes of prematurity for doctors and nurses - these had a positive effect on knowledge acquisition and subsequent parental advice. There is evidence that online resources have been of value to HVs in relation to infant feeding/breast-feeding (Condon et al., 2015), and that practice-based opportunities provide an effective learning opportunity to enhance knowledge and confidence with premature babies in the home environment (Parker

et al., 2012). Garcia and Gephart (2013) discussed the value of resources that can be shared with parents to help them identify the signs of normal and abnormal development of their baby.

Finally, this study emphasised the importance of knowledge as an underlying basis of practice. Nurses and allied health professionals must have the required knowledge, skills, and attitudes necessary to take actions that will achieve optimal neonatal outcomes (Turrill, 2014; Spence et al., 2016; Petty et al., 2019). Knowledge is important for specialist healthcare practice as it shapes behaviour (Decker and Hamilton, 2018), in this case the ability to support parents of premature babies at home. It is essential that any additional training/education, enables students and staff to integrate theory and practice (Hatlevik, 2012), strengthening, and building on, the theoretical components of any previous initial education programmes. Identified barriers to meeting learning needs, as emphasised earlier, must of course be acknowledged and addressed so that appropriate education can be delivered in light of these.

6. Conclusion

Parental perceptions of post-discharge neonatal care refer to this as being a period of high stress and uncertainty (Petty et al., 2018; Fowler et al., 2019), particularly in relation to their ability to best care for their premature baby. As a result, high value is placed on relationships with the healthcare team. Community-based health professionals certainly play a pivotal role in supporting parents; hence the need to explore what knowledge and learning is required to enable them to do this effectively. Tailored education and/or resources require development that will enable optimal support and help to facilitate positive outcomes for both the parent(s) and their babies.

Conflicts of Interest Statement

There is no conflict of interest to declare.

Funding statement

The study was funded by an internal grant awarded by the University of Hertfordshire in collaboration with University of Technology, Sydney.

Ethical statement

The study design and procedures were approved by University of Hertfordshire Ethics Committee; Protocol number - HSK/SF/UH/03364.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jnn.2019.07.002>.

References

- Appleton, J.V., Harris, M., Kelly, C., Huppe, I., 2014. 'Think Baby': online learning for student health visitors. *Community Pract.* 87 (6), 20.
- Blanco, F., Suresh, G., Howard, D., Soll, R.F., 2005. Ensuring accurate knowledge of prematurity outcomes for prenatal counselling. *Pediatrics* 115 (4), e478–e487.
- Boss, R.D., Hobbs, J.E., 2013. Continuity of care for NICU graduates. *Contemp. Pediatr.* 30, 28–34. Accessed June 7th 2019 at: <https://www.contemporarypediatrics.com/modern-medicine-feature-articles/continuity-care-nicu-graduates>.
- Boykova, M., Kenner, C., 2012. Transition from hospital to home for parents of preterm infants. *J. Perinat. Neonatal Nurs.* 26 (1), 81–87.
- Boyle, C.A., Boulet, S., Schieve, L.A., Cohen, R.A., Blumberg, S.J., Yeargin-Allsopp, M., Visser, S., Kogan, M.D., 2011. Trends in the prevalence of developmental disabilities in US children: 1997–2008. *Pediatrics* 127 (6), 1034–1042.
- Braun, V., Clarke, V., 2014. What can "thematic analysis" offer health and wellbeing researchers? *Int. J. Qual. Stud. Health Well-Being* 9, 26152. <https://doi.org/10.3402/qhw.v9.26152>.

- Burnham, N., Feeley, N., Sherrard, K., 2013. Parents' perceptions regarding readiness for their infant's discharge from the NICU. *Neonatal Network* 32 (5), 324–334.
- Burns, J., Conway, D.I., Gnich, W., Macpherson, L.M., 2017. Linking families with pre-school children from healthcare services to community resources: a systematic review protocol. *Syst. Rev.* 6 (1), 50.
- Condon, L., Murray, J., Messer, S., 2015. Can breastfeeding support be taught online? An evaluation of a training package for student health visitors. *J. Health Vis.* 3 (2), 100–106.
- Cordewener, D., Lubbe, W., 2017. Professional nurses' perceptions of skills required for performing preterm infants' follow-up assessments. *J. Perinat. Neonatal Nurs.* 31 (3), 256–262.
- Creswell, J.W., Plano Clark, V.L., 2007. *Designing and Conducting Mixed Methods Research*. Sage Publications Ltd, London.
- Decker, V.B., Hamilton, R.M., 2018. The nursing knowledge pyramid: a theory of the structure of nursing knowledge. *Adv. Nurs. Sci.* 41 (3), 293–302. <https://doi.org/10.1097/ANS.0000000000000204>.
- Einaudi, M.A., Gire, C., Loundou, A., Le Coz, P., Auquier, P., 2013. 'Quality of life assessment in preterm children: physicians' knowledge, attitude, belief, practice-a KABP study' *BMC Paediatr.* 13 (1), 58.
- Etikan, I., Musa, S.A., Alkassim, R.S., 2016. Comparison of convenience sampling and purposive sampling. *Am. J. Theor. Appl. Stat.* 5 (1), 1–4.
- Fowler, C., Green, J., Elliott, D., Petty, J., Whiting, L., 2019. The forgotten mothers of extremely preterm babies: a qualitative study. *J. Clin. Nurs.* <https://doi.org/10.1111/jocn.14820>.
- Garcia, C., Gephart, S.M., 2013. The effectiveness of early intervention programs for NICU graduates. *Adv. Neonatal Care* 13 (4), 272–278.
- Gupta, V.B., O'Connor, K.G., Quezada-Gomez, C., 2004. Care coordination services in pediatric practices. *Pediatrics* 113 (5 Suppl. 1), 1517–1521.
- Hatlevik, I.K.R., 2012. The theory-practice relationship: reflective skills and theoretical knowledge as key factors in bridging the gap between theory and practice in initial nursing education. *J. Adv. Nurs.* 68 (4), 868–877.
- Heale, R., Forbes, D., 2013. Understanding Triangulation in Research. *Evidence-Based Nursing*. ebnurs-2013. Accessed June 8th, 2019 at: <https://ebn.bmj.com/content/16/4/98>.
- Hobbs, J.E., DonohueHussey-Gardner, B.T., Donahue, P.K., 2015. Pediatrician perspectives: Caring for NICU graduates in the community. *Contemp. Pediatr.* 32 (12), 18.
- King, N., 2004. Using templates in the thematic analysis of text. In: Cassell, C., Symon, G. (Eds.), *Essential Guide to Qualitative Methods in Organizational Research*. Sage, London, UK, pp. 257–270.
- Kuppala, V.S., Tabangin, M., Haberman, B., Steichen, J., Yoltan, K., 2012. Current state of high-risk infant follow-up care in the United States: results of a national survey of academic follow-up programs. *J. Perinatol.* 32 (4), 293–298.
- Landy, R., Cameron, C., Au, A., Cameron, D., O'Brien, K., Robrigado, K., et al., 2016. Educational strategies to enhance reflexivity among clinicians and health professional students: a scoping study. In *Forum Qual. Soz./Forum: Qual. Soc. Res.* 17 (3). <http://eprints.lse.ac.uk/68328/>.
- Malone, M., Whittaker, K.A., Cowley, S., Ezhova, I., Maben, J., 2016. Health visitor education for today's Britain: messages from a narrative review of the health visitor literature. *Nurse Educ. Today* 44, 175–186.
- Nowell, L.S., Norris, J.M., White, D.E., Moules, N.J., 2017. Thematic analysis: striving to meet the trustworthiness criteria. *Int. J. Qual. Methods* 16 (1), 1–13.
- O'Cathain, A., Murphy, E., Nicholl, J., 2010. Three techniques for integrating data in mixed methods studies. *BMJ* 341, 4587.
- Parker, M., Kamholz, K., Brodsky, D., Zuckerman, B., 2012. Neonatal intensive care unit graduate home visit: a learning opportunity for pediatric interns. *J. Pediatr.* 161 (2), 177–178.
- Petty, J., Whiting, L., Green, J., Fowler, C., 2018. Parents' views on preparation to care for extremely premature infants at home. *Nurs. Child. Young People* 31 (1). <https://doi.org/10.7748/ncyp.2018.e1084>.
- Petty, J., Jarvis, J., Thomas, R., 2019. Understanding parents' emotional experiences for neonatal education: A narrative, interpretive approach. *J. Clin. Nurs.* 28 (9–10), 1911–1924.
- Powell, M., Kim, U.O., Weisgerber, M.C., Simpson, P.M., Nugent, M., Basir, M.A., 2012. Readiness of obstetric professionals to inform parents regarding potential outcome of premature infants. *J. Obstet. Gynaecol.* 32 (4), 326–331.
- Pridham, K.A., Krolikowski, M.M., Limbo, R.K., Paradowski, J., Rudd, N., Meurer, J.R., Uttech, Henriques, J.B., 2006. 'Guiding mothers' management of health problems of very low birth-weight infants' *Public Health Nurs.* 23 (3), 205–215.
- Rolfe, G., 2006. Validity, trustworthiness and rigour: quality and the idea of qualitative research. *J. Adv. Nurs.* 53 (3), 304–310.
- Smith, V.C., Young, S., Pursley, D.M., McCormick, M.C., Zupancic, J.A.F., 2009. Are families prepared for discharge from the NICU. *J. Perinatol.* 29 (9), 623–629.
- Spence, K., Sinclair, L., Morritt, M., Lou, Laing, S., 2016. Knowledge and learning in speciality practice. *J. Neonatal Nurs.* 22 (6), 263–276.
- Tariq, S., Woodman, J., 2013. Using mixed methods in health research. *JRSM Short Rep.* 4 (6). <https://doi.org/10.1177/2042533313479.2042533313479197>.
- Turrill, S., 2014. The education of UK specialised neonatal nurses: reviewing the rationale for creating a standard competency framework. *Nurse Educ. Pract.* 14 (5), 504–511.