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DOI:
[10.1111/apa.13715](https://doi.org/10.1111/apa.13715)

Document Version
Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Gullino, S., Kaiser, A., Khan, H., Phillips, A., Elwin, A., & Edwards, A. D. (2016). New mothers' experiences of the urban environment with their preterm infants involve complex social, emotional and psychological processes. *Acta Paediatrica, International Journal of Paediatrics*. <https://doi.org/10.1111/apa.13715>

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Received Date : 19-Apr-2016

Revised Date : 24-Jul-2016

Accepted Date : 13-Dec-2016

Article type : Regular Article

New mothers' experiences of the urban environment with their preterm infants involve complex social, emotional and psychological processes

Short title: New mothers and the urban environment

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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/apa.13715

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ABSTRACT

Aim: Studies have explored how mothers and premature babies make the transition from a neonatal unit (NNU) to home, but little is known about how mothers cope with urban life with a vulnerable baby. This controlled trial investigated how first-time mothers with singleton preterm babies handled that experience in the first few months after discharge from a NNU, compared to the first-time mothers of healthy, singleton term-born infants.

Methods: This parent-led, qualitative study was carried out in London, UK, from 2013-2015 and used diaries and walking interviews with researchers. Thematic network analysis was performed to provide insights into the experiences of these 19 mothers.

Results: The two groups had similar experiences and needs in the urban environment and these common experiences of city life shaped their new identities as mothers. However, the mothers of preterm babies had difficulties developing supportive relationships and seeking affirming social environments.

Conclusion: This study highlights what the mothers of preterm babies experienced in the first few months after their infant was discharged from hospital. It stresses the need to understand the complexity of the mothers' social, emotional and psychological processes when they make the transition from home to visit the city with a vulnerable baby.

Key notes:

- This study investigated how 19 first-time mothers with singleton preterm or full-term babies handled being out in London in the first few months after their infant was discharged.
- The two groups had similar experiences and needs when they were in the urban environment and these shaped their new identities as mothers.

- However, the mothers of preterm babies had difficulty in developing supportive relationships and seeking affirming social environments.

Keywords:

Motherhood, preterm babies, qualitative study, transition, urban environment

INTRODUCTION

Parental engagement in the care of preterm infants in neonatal units (NNU) has long been recognised as essential for the mutual wellbeing of parents and babies. It can vary from parents' involvement in pain management of preterm infants (1) to parents' consultation on neonatal care and services and from opportunities for parents' empowerment through educational-behavioural intervention programmes (2) to family integrated care (3). All these forms of involvement focus on the healthcare of young preterm infants while they are still in hospital, rather than after discharge.

The delicate transition from the clinical setting of a NNU to home has been documented by a few studies (4,5) and supporting parents, particularly mothers as they are most frequently the main carers during this process, is already a focus of medical policies and practices. Yet, there has been less research on how the transition from home to urban life affects a mother and her preterm baby. Little is known about how mothers with a preterm, vulnerable baby experience life in a city (6). This focus is important, as motherhood is not only a biological event, but is socially and culturally constructed in the urban contexts mothers live in (7). This parent-led, qualitative study ran between June 2013 and February 2015 and examined how mothers with babies admitted to an NNU experienced the city in the first months after discharge, compared to mothers of healthy, term-born infants (8). This was an issue of personal interest to the authors (SG and AE), as their own children had been in an NNU.

METHODS

The study analysed data generated by paper diaries, electronic diaries that identified where the mother was when she recorded her feelings and walking interviews. Walking interviews are commonly used in urban planning and geography studies, but are a novel qualitative method in health studies. They consisted of carrying out interviews while walking alongside the mothers and babies observing their engagement with the environment.

Participants

We recruited first-time mothers living in the inner city London Boroughs of Wandsworth, Lambeth, Southwark or Lewisham who had a good level of English and a partner. Their babies were singleton babies born and nursed at St Thomas' Hospital. The aim was to recruit 20 mothers. We decided to recruit participants who were mothers for the first time, as having other children would have influenced the mothers' behaviour in the environment, and who were in a relationship, as not having a partner would have been a complicating factor.

We used a subject-control research design. The subject group consisted of mothers whose babies had been in the NNU of St Thomas' Hospital for at least a month. The control group consisted of mothers whose term babies were born in St Thomas' Hospital and suffered no complications requiring admission to NNU. The subjects and controls were matched by electoral wards or postcodes (Table 1).

Paper and geolocated electronic diaries

The mothers were asked to keep a daily diary for four months after leaving the hospital.

These were structured, rather than free text, and were completed between October 2013 and October 2014. They aimed to record the activities mothers engaged in with their baby outside the home environment (9,10), for example meeting with other mothers, joining playgroups or children's centres, walking in a park and so on. We offered the diary in alternative formats.

The paper diary was a simple paper calendar where participants noted their activities, their location and the emotions they experienced - positive, negative or neutral - at the time.

The electronic diary was the same as the paper version. We developed a web-based application that could be accessed from any web-enabled device, such as a smartphone, tablet or computer. The electronic format gave the mothers the opportunity to fill in details of the outing with the baby while they were still engaged in the activity and to record the exact location of the activity with the smartphone's global positioning system (GPS) (11). For retrospective entries, the GPS function was disabled.

Walking interviews

At the end of the four-month period, we invited participants to a walking interview with two of the researchers (SG and AE). The researchers walked alongside the mothers to observe their experiences and make sense of their everyday practice (12,13). This research method was essential as it enabled the researchers to see the participants in their local environment and investigate their relationship within that context. The walks were entirely led by mothers and took about an hour. We used a mobile mapping and data collection application called FieldTrip GB (EDINA, The University of Edinburgh, UK) to take photographs of places mentioned by participants and geomapped and located them on the plotted routes.

The interviews did not all involve walking. For example, in a few cases when the baby was asleep at the scheduled time of interview, we ran an indoor virtual walking interview, where printed maps were used to discuss places and environment. All the interviews ran between March 2014 and October 2014 and were recorded electronically, transcribed and anonymised by one of the authors (AE).

Thematic analysis

All the data - diary entries, interview transcripts, reflective field notes and memos - generated from the two groups of mothers were coded with the support of NVivo software (QSR International, Melbourne, Australia) (14).

Code development was carried out using a random set of eight interviews across the two groups, as this was considered sufficient to start identifying the variety of codes in the data (15). Further issues emerging from the rest of the transcripts were added later.

A codebook, with clear descriptions and examples from data, was prepared to provide formalised operationalisation of the codes and keep consistency during the coding process (16). Data were then dissected into text segments and coded using the codebook. The subsequent phase consisted of identifying significant themes from the coded text and constructing thematic networks (17) (Figure 1).

Validity

The rigour of the qualitative research methods was maintained by adopting triangulation, that is multiple methods and multiple researchers, reflexivity and respondent validation. The findings were back to the participants and their views on the interpretations were collected during a final workshop.

RESULTS

In this study, 10 subjects, whose baby had a gestational age of between 22 and 32 weeks, and 10 controls were recruited but for logistical reasons we failed to match up one pair (Table 1). Despite the socio-economic diversity of the catchment area, the sample was relatively homogeneous and the mothers we recruited were mainly, but unintentionally, highly-educated, working women. No specific reason was given by the four women - two in the preterm groups and two in the full term group - who withdrew from the study. It was also a coincidence that all the preterm babies enrolled in the study suffered bronchopulmonary dysplasia and were discharged home on oxygen.

We identified 37 basic themes, clustered in nine organising themes under three global themes, which were relevant to both groups of participants (Table 2). Both groups of mothers experienced the urban environment, with and through their babies, by feeling the need to be part of the city, by seeing their interaction with the environment changed and through social networks.

Similar experiences of the environment by mothers from both groups

Subject and control mothers revealed the need to be part of the city with their new baby by going out and by finding places to interact with other mothers. The mothers said that the lack of space at home was the driving force behind the need to go out and escape the confines of home, even in the rain, for their personal health and baby's health and well-being: *"I would go a bit crazy if I was stuck at home"* and *"get out of the flat and get some fresh air"* were just a few of the many comments.

Interacting with the urban environment was, therefore, inevitable.

The lack of local family support systems often required mothers to find places to interact with other mothers. As Anna, one of the mothers of a full-time baby, said, she needed: *"someone to talk to, to ring with silly questions"*. Moving around the city with their baby offered both groups the opportunity to join parent-led or children centred playgroups. The mothers of full-term babies

specifically mentioned mother and baby classes, such as baby massage, yoga, music and swimming.

However, in order to establish relationships in London the mothers needed to be assertive, reach out to new friends and develop and maintain relationships. As Debby, mother of a full-term baby, said: *“I did a baby massage course there to begin with, with Ella, which was really good, but didn’t really come away with any friends from it, but it was good for me and her”*.

The combined and individual needs of the mothers and babies meant that the way both groups of mothers interacted with the urban environment changed in terms of movement, modes of movement and meanings. All the mothers found that physical constraints, like mobility and accessibility to public transport, were major limitations when it came to being mobile in London and having a fuller social life. The underground Tube system was almost impossible to access safely with a pram: *“I don’t want to take the Tube and if I can avoid it I won’t take the bus”* said Matilda, the mother of a preterm baby. Only a few mothers from the full-term group occasionally used the Tube.

However, they only did it if both the departure and arrival stations were entirely step free, they were accompanied by their partners or they were using a baby carrier instead of a pram. *“I don’t really get on a bus unless she’s on me, so I quite often use a sling not the pram”* said Debby, the mother of a full-term baby. Both groups found that learning to negotiate how to be mobile in the urban environment was an important part of how they gained more confidence and independence in their new role as mothers and in circulating in London with a newborn baby. For example they did this by using adapting strategies, like walking and using the bus instead of the underground, and by developing time and space management skills in order to avoid rush hour.

The walking interviews drew out the importance of walking as an alternative form of transport and as a leisure activity for their own wellbeing. By repeating their practice of walking daily, the mothers said that they learned about different features of the urban environments. Mothers also highlighted how local facilities changed in terms of their importance and meaning, like open spaces and local shops. As Debby, the mother of a full-term baby said: *“My daily trip to the local supermarket generally makes an excuse, I like to come down with a reason... I can’t believe it has become my local*

hang out". The mothers also found that now they had a baby that their new criteria for a nice café included being child friendly and providing space for prams. As Sara, the mother of a preterm baby said: *"The local café is nice. There is not a huge amount of space, but they are very welcoming of children as it's family run"*.

Different experiences of the environment for mothers of preterm babies

In comparison to the mothers of full-term babies, the mothers of preterm babies experienced the urban environment by feeling challenged in establishing supportive relationships and in seeking affirming mother and baby social environments.

The mothers of preterm babies lacked pre-established social birth-focused networks to refer to. For example, the National Childbirth Trust, a UK-based charity, offers parents-to-be with a ready-made support network. However, the mothers of the premature babies tended to give birth before they had the opportunity to join the activities and networks offered by the charity. Mothers of premature babies tended to rely on more limited networks of some of the mothers they had met in hospital or had been introduced to. Some struggled to find new local friendships and some found it difficult to develop them through regular meetings at playgroups, because their babies' medical appointments tended to disrupt their social routines. A few mothers told us about their relationships with other mothers while they were in the NNU, but also talked about the difficulties of remaining in contact with them because of living some distance away and travelling problems. In this sense, social media like Facebook and messaging on WhatsApp played an important role. Establishing new relationships with people, often referred to as unfamiliar, was frightening for a number of reasons, as unfamiliar people coughed or smoked near the baby and stared or made comments about their size or condition. Elizabeth, the mother of a preterm baby said that *"...people kept staring at us because she was on an oxygen tank and because she was so tiny for her age. I went to the playground once or*

twice but I didn't go back". Mothers were also worried about people touching the baby while cooing at them. As Georgia, the mother of a term baby, said: "I'm pushing the baby along the aisles of the supermarket and you can just see people say oh isn't he gorgeous, and then they coo over him and I'm like don't touch him, I don't know where your hands have been. Move".

The mothers with preterm babies sought affirming social environments where they could fulfil their need to be part of the city, but they were more selective about choosing places to go with their baby, in order to protect them from infections. As Matilda, the mother of a preterm baby, explained: *"I think infections are my main obsession and that's why I wouldn't go to places which are crowded which don't have outdoor seating, for example, in summer and I prefer more open spaces than small spaces".*

The mothers in the preterm group felt excluded from mother and baby activity classes, partly because their babies were still fragile and susceptible to infections compared to term babies and partly because of on-going health concerns. These mothers found it more reassuring to meet with one mother at a time or join small, selected parent-led playgroups.

However, they recognised how their experience of being new mothers of preterm babies in London progressively changed: *"I think as she is now older I find myself doing more and more things I wouldn't have done in the beginning",* said Matilda, the mother of a preterm baby. Some mothers considered joining activity classes, and mixing with other mothers and their full-term babies, once the winter season was over and their babies were a bit older and bigger.

DISCUSSION

In the first weeks after giving birth, new mothers generally tended to readjust to new rhythms of life with a newborn baby in their home environment. However, existing research reported that the urban environment was an important dimension of motherhood, as going out and interacting with

other mothers through social networks and mother and baby activities contributed to defining their new identities as mothers (18).

For the mothers of preterm hospitalised babies, motherhood has been shown to be a more complex process. It starts in a public and medical environment, where mothers become dependent on the support of the healthcare staff (19), and progresses with the transition from hospital to home and from home to urban life. In this research, we focused on the experiences of a vulnerable group, which until now had been overlooked by health and urban studies and aimed to investigate to what extent their experiences of the environment were different to the mothers of full-term babies.

Our study showed that the mothers of preterm babies experienced the urban environment in some similar and some contrasting ways to the full-term group. It was significant for both groups of mothers that the way they experienced the city was intertwined with their identity as mothers. Motherhood emerged as more than a biological event, as it was socially and culturally shaped by the different contexts the women lived in and the mothers' and the babies' experiences (20). This spatial dimension of motherhood (21, 22) emerged from both groups. However, the social experience of the urban environment was more challenging for the pre-term group. Because they were excluded from pre-established social networks like the National Childcare Trust, for the reasons explained above, they found it challenging to establish new relationships and find affirming places to go with their babies.

Our findings were qualified by the fact that we focused on a small, homogeneous group of mainly high-educated, working women and in the catchment area of a NNU with an outreach team in inner London. Discussions with participants in the study were mostly in relation to mother and baby social activities that could vary from stay and play sessions organised in children centres to more sophisticated and exclusive activities like swimming lessons in private centres or parent-led groups in child friendly restaurants.

Future research might demonstrate whether the same results would be obtained with a more heterogeneous group of respondents. The strengths of our study were that it was an original study of inner city families, using geolocation and incorporating matched controls. The limitations were that the matching was imperfect and that there was a disproportionate number of educated women and babies going home with oxygen. In addition, we could not control for factors such as some microenvironments being more traditionally family and child oriented, having higher residential densities, having access to private transport or having great accessibility to public transport and to open spaces.

CONCLUSION

This study contributes to our understanding of the complexities of mothers' social, emotional and psychological processes during the multiple transitions from a NNU to living in an urban environment with a vulnerable preterm baby. This study also establishes a correlation between the urban environment and the important role that healthcare professionals in the NNU can play in encouraging social relationships between the mothers of preterm babies while the babies are still in the unit.

The NNU and their outreach teams need to understand what happens when mothers try to integrate into urban life and help them to transform their post-hospital motherhood experiences into more socially integrated experiences in a challenging context like inner London. This is important for the mothers' own identity and also for their wellbeing and their babies' wellbeing.

Acknowledgements

We wish to thank the mothers and the babies who participated in the study, the Department of Perinatal Imaging and Health, the staff of the Neonatal Unit and post-natal wards, Guy's and St Thomas' NHS Foundation Trust, the Biomedical Research Centre at Guy's and St Thomas' NHS Foundation Trust, the Wellcome MEC Centre and our critical friends Dr Heidi Seetzen (Kingston University) and Dr Kevin Burchell (Policy Studies Institute, University of Westminster).

Funding

This study was funded by a grant from the Garfield Weston Foundation and funded and supported by the National Institute for Health Research Biomedical Research Centre based at Guy's and St Thomas' NHS Foundation Trust and King's College London.

Conflict of interests

The authors have no conflicts of interest to declare.

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Table 1 - Characteristics of the participating mothers

Participant	Borough	Data collection**	Status
Preterm mother	Southwark	Electronic diary, walking interview	
Full-term mother	Southwark	Electronic diary* and walking interview	
Preterm mother	Southwark	Paper diary* and virtual walking interview	
Full-term mother	Southwark	Electronic diary	Withdrawn***
Preterm mother	Lambeth	Electronic diary and virtual walking interview	
Full-term mother	Lambeth	Electronic diary and virtual walking interview	
Preterm mother	Lambeth	Paper diary and virtual walking interview	
Full-term mother	Lambeth	Electronic diary and walking interview	
Preterm mother	Lambeth	Electronic diary and email interview	
Full-term mother	Lambeth	Paper diary and walking interview	
Preterm mother	Wandsworth	Electronic diary* and interview over the phone	
Full-term mother	Lambeth	Electronic diary* and walking interview	
Preterm mother	Southwark	Electronic diary and virtual walking interview	
Missing			
Preterm mother	Southwark	Paper diary*	Withdrawn***
Full-term mother	Southwark	Paper diary*	Withdrawn***
Preterm mother	Lambeth	Electronic diary and virtual walking interview	
Full-term mother	Lambeth	Paper diary and email interview	
Preterm mother	Southwark	Electronic diary*	Withdrawn***
Full-term mother	Southwark	Electronic diary and virtual walking interview	

*some diaries were returned empty ** the researchers also produced reflective field notes and memos for each participant *** withdrawals were not due to any specific reason

Table 2 –Basic, organising and global themes common to both groups, but with different intensities

Global themes	Organising themes	Basic themes
Feeling part of the city	Babies vulnerabilities*	<ul style="list-style-type: none"> • Health complications/prematurity • Oxygen and other aids
	Motivation for going out	<ul style="list-style-type: none"> • Mother's health and well-being • Baby's health and well-being
	Places to go with the baby	<ul style="list-style-type: none"> • Child friendly cafes • Family and friends' houses • Clinics and follow ups • Parks and open spaces • Playgroups
	Activities to do with the baby	<ul style="list-style-type: none"> • Mother and baby classes • Specifically targeted groups • Walking • Weekend/holidays activities
Changes in the interaction with the environment	Local urban context	<ul style="list-style-type: none"> • Environmental and physical characteristics • Physical and social infrastructures • Local amenities and services • House location
	Physical and social constraints	<ul style="list-style-type: none"> • Public transport • Weather • Urban mobility and travelling • Breast/formula feeding • Crowded spaces
	Adaptation to the urban environment	<ul style="list-style-type: none"> • Transport strategies • Time and space management • Changes over time • Attentiveness
Social networks	Mother's attitude	<ul style="list-style-type: none"> • Organised • Assertiveness and self-confidence
	Significant relationships	<ul style="list-style-type: none"> • Other mums • Extended family • Old friends • National Childbirth Trust group • Partner

	<ul style="list-style-type: none"> • Unfamiliar people • Outreach team and health carers • Social media and internet
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*Theme exclusively related to the subject group

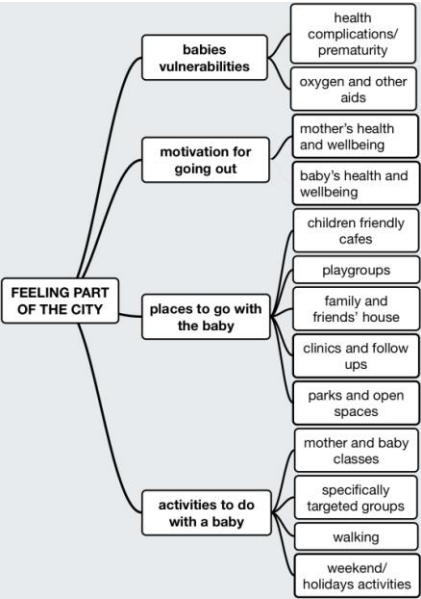


Figure 1 – results for the global theme of ‘selective choice’. The left hand column shows the global theme, the middle column organising themes and the right hand column basic theme