Not a level playing field: A qualitative study exploring structural, community and individual determinants of greenspace use amongst low-income multi-ethnic families

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ABSTRACT

Greenspace is important for physical and mental health. Low-income, multi-ethnic populations in deprived urban areas experience several barriers to using greenspace. This may exacerbate health inequalities. The current study explored structural and individual determinants of greenspace use amongst parents of young children in an urban, deprived, multi-cultural area situated in the North of England, UK. Semi-structured in-depth interviews and focus group discussions were conducted with 30 parents of children aged 0–3 between December 2016 and May 2017 from a range of ethnic groups. Thematic analyses were informed by the Human Health Habitat Map and the Theoretical Domains Framework. The results show that whilst all families recognised the benefits of greenspaces, use was bounded by a variety of structural, community, and individual determinants. Individual determinants preventing use included lack of knowledge about where to go, or how to get there and confidence in managing young children whilst outdoors. Fear of crime, antisocial behaviour and accidents were the overriding barriers to use, even in high quality spaces. Social and community influences both positively encouraged use (for example, positive social interactions, and practical support by others) and prevented use (antisocial or inappropriate behaviours experienced in greenspace). The built environment was a key barrier to use. Problems related to unsuitable or unsafe playgrounds, no gardens or safe areas for children's play, poor accessibility, and lack of toilets were identified. However, the value that parents and children placed on natural blue and green features was an enabler to use. Contextual influences included external time pressures, difficulties of transporting and caring for young children and poor weather. Multi-sectoral efforts are needed to tackle the uneven playing field experienced by multi-ethnic, urban, deprived communities. Initiatives to increase use should tackle structural quality issues, addressing fears about safety, whilst simultaneously encouraging communities to reclaim their local greenspaces.

1. Background

A large body of literature highlights the importance of greenspace as determinant of both physical and mental health (Gascon et al., 2015; Hartig et al., 2014; WHO Regional Office for Europe, 2016). Greenspace can take a variety of forms, but is generally recognised as encompassing all forms of natural environments which include green vegetation such as open countryside, parks, woodland, allotments (a plot of land rented by individuals for growing fruit, vegetables or flowers) and cemeteries (Taylor and Hochuli, 2017). Over 70% of Europeans currently live in urban areas, with this level set to reach 80% by 2050 (United Nations, 2015). As such, urban greenspaces may be particularly important for

the quality of life of urban dwellers (World Health Organisation (WHO) and UN Habitat, 2016). Mechanisms which explain the effect of greenspace on health have been suggested to include: increased relaxation and restoration, improved social capital, increased physical activity, improved functioning of the immune system, buffering against the negative effects of noise and air pollution, enhanced pro-environmental behaviour and improved sleep (WHO Regional Office for Europe, 2016). Epidemiological evidence suggests that the beneficial effects of greenspaces are greater amongst more deprived communities (Dadvand et al., 2014; McEachan et al., 2016; Mitchell and Popham, 2008). Thus, interventions to improve access to greenspace are often cited as being key to reducing health inequalities (Mitchell and

Popham, 2008). However, provision alone is unlikely to be enough to accrue health benefits; research has demonstrated that active use of greenspaces is critical to maximising their health benefits (Bowler et al., 2010; McEachan et al., 2016).

In terms of promoting and improving health and wellbeing at a population level, pregnancy and early childhood presents a critical opportunity where improving health for both mother and infant can have a lasting influence on later health trajectories (Britto et al., 2017). Given the proposed relationship between contact with nature and children's mental and physical development (Kellert, 2002; McEachan et al., 2018), interventions which promote the availability of, and use of, greenspace by young families in low-income areas may be particularly effective in improving health outcomes. However, within the UK there are major disparities in the use of urban greenspaces, with more deprived and ethnic minority populations typically reporting less use than other groups (Burt et al., 2013). With growing emphasis on promotion of greenspace use for health and wellbeing, this could further exacerbate heath inequalities experienced by these groups.

Low income and/or multi-ethnic groups experience multiple barriers which can stop them from using urban greenspaces. At a structural level, areas with more indicators of social and/or economic deprivation typically have less access to urban greenspaces, and where greenspace is available, it may be of poorer quality (Rigolon, 2016). Quality of urban greenspaces has been shown to be associated with both satisfaction and use of greenspace (Roberts et al., 2018b), and a recent study found satisfaction with local greenspace to be a more important predictor of children's mental wellbeing than availability of greenspace (McEachan et al., 2018). In addition to quality, perceived safety is another key barrier affecting greenspace use (Roe et al., 2016). Use amongst low-income or ethnic minority groups is also heavily influenced by beliefs about benefits of greenspace, whether they would feel welcomed, and other perceived barriers including cultural and language restrictions (Das et al., 2017). There is a need for research which systematically explores the barriers to greenspace use amongst low-income, multi-ethnic groups within the UK to help develop guidance about how to encourage these groups to visit urban greenspaces more. To our knowledge there is no research which focuses on the experiences of young families using these spaces, a population group which may encounter particular challenges when accessing outdoor environments. The current study aims to address this gap by exploring what factors help or hinder greenspace use in families with young children in the context of an ethnically diverse, deprived urban area.

1.1. Determinants of greenspace use

In order to develop effective strategies to increase use of greenspace it is necessary to develop a deeper understanding of the barriers and enablers to using greenspace. Socio-ecological views of behaviour, popularised in the 1990s, place individuals at the centre of a complex system where behaviours (in this case using greenspace) are influenced not only by individual characteristics, but also by the wider socio-economic, cultural and environment context in which they live (Dahlgren and Whitehead, 1991). The 'Health Map for Local Human Habitat' (subsequently referred to as the Health Map, Barton and Grant, 2006) is a useful adaptation of Dahlgren and Whitehead's 'rainbow' model which outlines the various environmental and ecosystem influences on health and wellbeing, in addition to social and individual factors. The Health Map places individuals at the centre of a wider system which sees health and wellbeing influenced by lifestyles, communities, the local economy, by activities (e.g. traveling) which take place in the local neighbourhood; and by the built environment, the natural environment and the wider global ecosystem (see Box 1).

With its focus on environmental aspects of influence this model seems particularly relevant to explore the reasons by which communities use and access their local greenspaces. However, the model is less detailed about the individual factors which act as barriers or enablers to

behaviour. On the other hand social cognition theories outline a range of 'determinants' (e.g. beliefs or motivations) which are thought to influence behaviour (Conner and Norman, 2015). Theories of behaviour change assert that if beliefs and motivations which influence behaviour can be identified, then they can also potentially be modified to increase likelihood of individuals engaging in those behaviours. The Theoretical Domains Framework (TDF, Cane et al., 2012) summarises 14 such key modifiable factors which are thought to act as either barriers or enablers to engaging in behaviour. These domains are also outlined in Box 1. We view these theoretical perspectives as complementary: where the TDF provides detailed information on the determinants of individual behaviours, the Health Map allows identification of the wider structural factors which may influence whether communities use their local greenspaces.

1.2. Aim of current study

The aim of the current study was to explore determinants (both barriers and enablers) of urban greenspace use amongst a low income, multi-ethnic sample of parents with young children (aged 0–3) living in an area of high deprivation. We use both the Health Map, and the TDF as conceptual frameworks to explore barriers and enablers. By using these frameworks we hope to be able to help policy and decision makers identify clear key targets for intervention.

2. Methods

2.1. Design

Semi-structured, in-depth interviews were conducted with parents to generate insight into reasons why parents do and do not take their children to parks and green spaces. The study was approved by the University of Bradford Research Ethics committee (Reference EC2399, 31st October 2016).

2.2. Setting

The study was set within three multi-ethnic electoral wards in a large city (> 500,000 inhabitants) in the North of England. The three wards were located in the most deprived quintiles of the index of multiple deprivation in relation to UK averages, and accounted for 12.3% of the total population of the city (Dickerson et al., 2016). Within the three wards 48.6% of people are of Pakistani origin, and 24.8% are white British, 5.2% are Bangladeshi, 3.8% are Indian, and 3.2% are Black. There is a diverse range of other ethnic groups within the city (14.4%) which include increasing numbers of residents from central and eastern European countries with a large presence of Roma communities. The wards, which were adjacent to one another, contain four formal parks maintained parks greater than 0.5 hectares, and a number of other formal and informal green spaces; 13% of the land cover is greenspace of varying types, including playing fields, sports' facilities, play areas, and allotments.

2.3. Sample

Mothers and/or fathers of 0–3 year olds living within the study area were eligible to take part. We used a purposive stratified sampling strategy to recruit participants reflective of the study setting, aiming to recruit 20 parents from a range of ethnic groups.

2.4. Recruitment

Parents were recruited though networks of community organisations including children's centres, parenting projects, refugee drop-in and parent-toddler groups. The study was explained to participants by a member of the research team and participants were provided with an

Box 1

Outline of the Human Health Habit Map and Theoretical Domains Framework.

Human Health Habit Map

Aim: To foster cross-disciplinary understanding of the interplay between the built environment and health (Barton and Grant, 2006)

Domains:

People – Age, Sex, Hereditary factors

Lifestyle – Diet, Physical Activity, Work-life balance

Community – Social Capital, Social Networks

Local Economy – Wealth creation, Resilient markets

Activities – Working, Shopping, Moving, Living, Playing, Learning

Built environment – Buildings, Places, Streets, Routes

Natural environment – Natural habitats, Air, Water, Land

Global Ecosystem – Climate stability, Biodiversity

Theoretical Domains Framework

Aim: To simplify and integrate behaviour change theories to facilitate inter-disciplinary understanding of behaviour change principles (Cane et al., 2012)

Domains:

Knowledge

Skills

Social/Professional Role and Identity

Beliefs about Capabilities

Optimism Beliefs about Consequences

Reinforcement

Intentions Goals

Memory, Attention and Decision Processes Environmental Context and Resources

Social Influences

Emotions

Behavioural Regulation

information sheet. Where necessary, interpreters were used during the recruitment and interview process.

2.5. Procedure

If they agreed to participate, contact details were noted to then arrange a time and venue for the interview. Parents were provided a choice of location for the interview and most were interviewed in their own home with some taking place in community centres. Parents were often accompanied by their young children during the interview. Before the interview commenced participants were asked if they needed to go over the information sheet again, after which written informed consent to take part in the study was obtained. Some parents rearranged the appointment due to unforeseen circumstances such as medical emergencies or other family engagements. The interviews were conducted by the first author who is female and of white British/Irish heritage, spoke one of the minority languages, and who had over 12 years' experience in conducting and analysing qualitative research with ethnic minorities groups. The interviewer was employed as a research fellow at the time of the study, working in the area of greenspaces and children's health. The interviewer shared brief information about her family life, goals and research interests if asked by parents. Interviews were guided by an interview guide which was piloted before use, and were recorded using a digital recorder where parents gave permission. Where permission was not received for recordings, shorthand field notes were written up immediately after the interview. Interviews lasted between 30 and 75 min, and parents were offered a £10 supermarket voucher for their participation. Interviews were conducted between December 2016 and May 2017. Recordings of interviews were transcribed and anonymised, and translated where necessary.

2.6. Analyses

Thematic analyses were used to analyse the data (Braun and Clarke, 2006). Themes were generated using both inductive and deductive approaches. Two authors (AC, RM) read a sample of transcripts and met to discuss and agree emerging codes. A coding framework was first developed inductively. Initial codes and themes were found to match the health map and TDF frameworks well, and we therefore mapped the identified codes structured into the key domain areas of both models.

All transcripts were then coded by one author (AC) using the NVivo 12 software programme (QSR International). We allowed for the addition of new themes outside these frameworks if they emerged from the data. A second author (RM) then independently coded 10% of the transcripts according the agreed coding frame; agreement was 88%, differences were discussed and resolved. A copy of the full coding framework is available on request.

3. Results

Twenty-three parents (20 mothers and 3 fathers) were interviewed in 22 interviews; of these four were of white British Origin, seven were of Pakistani origin, four were of Eastern European origin, four of African origin. Four reported another ethnic origin (see Table 1). Thirteen participants were born in the UK. The mean age of respondents was 31 years, and families had on average 3 children. Interpreters were used in eight interviews. Permission to use a digital recorder was given for 16 interviews. In addition seven mothers recruited through a community centre elected to participate in a focus group instead of individual interviews; all were of African origin. No further demographic details were collected from this group. Of all parents approached, eight parents invited declined to participate because of a lack of time.

3.1. Determinants of green space use

We identified nine core themes influencing decisions to use greenspaces, these themes are presented in Fig. 1. Three themes from the Health Map were apparent (the natural environment, built environment and activities). Social and community influences were identified as important and straddled both the Health Map and the TDF. Another five key determinant areas were identified from the TDF; these included beliefs about consequences, emotion (labelled as fear in the current paper), beliefs about capabilities, knowledge, and context and resources. We will discuss each of these core themes in turn starting at the macro level (natural environment), before moving to the micro level (individual determinants).

3.1.1. Natural environment

The stimulation children found by experiencing natural environments, and interactions with animals was a key enabler to using

Table 1
Characteristics of interviewed participants (n = 23 from 21 households).

Age	25–29 years	n = 7
	30–34 years	n = 6
	35–40 years	n = 3
	40–44 years	n = 1
	Did not say	n = 6
	Mean age	31 years
	Range	25–41 years
Gender	Female	n = 20
	Male	n = 30
Ethnicity	African	n = 4
	Eastern European (including Roma)	n = 4
	Middle Eastern	n = 1
	Other South Asian	n = 1
	Pakistani	n = 7
	Western European	n = 1
	White British	n = 4
	Did not say	n = 1
Migrant status	Born in UK	n = 6
	Born outside UK	n = 13
	Did not say	n = 4
Fluency in English	Fluent	n = 14
	Not fluent	n = 7
	No English	n = 2
Living with partner/ spouse	Lives with partner (married and unmarried)	n = 17
	Single parent	n = 4
Employment status in household	Father and mother employed	n = 3
	Father employed, mother unemployed	n = 13
	Mother unemployed (single mother households)	n = 4
	Father and mother unemployed	n = 1
Car use in household	Access to a car n = 7 — Mum and dad drive family car	n = 2
	Just dad drives family car	n = 5
	No access to a car in household	n = 12
	Did not say	n = 2
Number of children per family (total, and aged under 4)	*Total* — 1 Child — n = 5 — *Under 4* — 1 Child	n = 17
	2 Children — n = 6 — 2 Children	n = 2
	3 Children — n = 3 — 3 Children	n = 1
	4 Children — n = 5 — Did not say	n = 1
	5+ Children — n = 2	
Reported disability of child in family	Reported disability n = 3	n = 3
	Did not report disability n = 20	n = 18

greenspaces. Young children found ducks, squirrels, dogs, horses and other birds and animals a source of stimulation as well as the physical features of the natural environment:

"… we get her out of the back carrier and she splashes in the river, plays with the dog and stuff, and plays in the wood … They like playing in the rivers, running up the banking, sliding down into the river, making it as a slide even when it's raining" P18 (Mum; white British)

And a mother of two visually impaired children without access to a garden noted how much her children benefited from the local natural environments:

"…I just take them out I want them to have that feeling the fresh air and we listen to the birds and the grass and the nature it's something totally different you know and they do need that" P8 (Mum of 2 visually impaired children; Pakistani)

3.1.2. Built environment

A range of built environment features were identified as barriers. Local playgrounds were seen to be very overcrowded in good weather with very little play equipment for babies and toddlers, especially babies too young to sit up. Whilst mixed age areas were seen as dangerous for young children, separated areas were also a problem because of either younger or siblings spent time in play areas not designed for

them. Some parents thought a little slide or swing in their garden could be just as good as the play area in a park. However not everyone had a garden, or a garden safe enough for young children. No parents allowed young children to play in their street and most saw their local neighbourhood as unsafe even for older children citing speeding cars, dangerous dogs and bullies as a danger.

Being out and about with a pushchair and young children on foot was another challenge. Steps, road crossings, distances, hills and park entrances all required extra negotiation. Whilst park entrances designed to stop motorbikes, quad bikes and horses entering can be useful, they stopped some pushchairs getting through.

"..couldn't get through, couldn't get past. And my pram is on the big side but it's not really big, even there's the twin prams as well … yeah, I was panicking, cause he [baby son] was getting really fussy, I couldn't entertain him anymore, had to lift the pushchair over this wall, this one guy actually came to help me" P4 (Mum; Western European)

Safety concerns were also a key barrier to use. Issues raised included safety of play equipment, water features, traffic, broken walls, litter; slippery surfaces and muddy areas:

"people don't use the park because of this because it's always wet and muddy, … all the swings and slides stay wet, they don't … I really make sure that I take wipes with me for the children to the park because obviously they get dirty and muddy and everything but then I can't take a brush or spade to clean up the glass as well" P10 (Mum; Pakistani)

3.1.3. Activities

All families reported visiting local greenspaces and performed a range of activities within these spaces. In addition to using formal play equipment parents reported a range of other activities their young children enjoyed including playing with vegetation (e.g. playing with leaves, trees, flowers), interacting with animals (e.g. feeding ducks and geese, seeing birds, squirrels, horse dogs and cats) and young children enjoying the freedom to run alone without holding hands, splashing, playing in sand, and digging soil.

"Yeah, and, you know, he just loves running around, he doesn't want anybody touching him, he won't even hold my hand, he's like, 'get off me, I want to walk on my own,' and he's only 17 months" P11 (Mum; Pakistani)

Parents were able to articulate the various motivations that prompted their use of greenspaces. For 'formal' pre-planned outings involving family and possibly extended family, parks were chosen based on the high quality of the space and range of facilities available. These included quality safe play areas, well-kept gardens, access to toilets, shelter, refreshments, clean grass for picnic and play, and special features.

"we tend to go different places each time, just to give the kids different places like we go to the park in [place name] a lot, the park in [place name], that's quite nice. Because they have like a train that goes round the lake and it's just something different" P17 (Mum, white British)

These areas tended to be further outside parents local neighbourhoods, and were thus not everyday events because there were often dependent on vehicles being available and someone able to drive. Families busy schedules (balancing work, school or religious activities) meant that for some, getting everyone together could be a challenge.

Impromptu, everyday trips to local greenspaces were of a different nature, when part of the family would make shorter visits to a local green space (often of poorer quality) that could be accessed on foot between school pick-ups or after school. This was partly because even where the household possessed a car, the mothers in the study mostly couldn't drive, making the time and cost of traveling to a further away green space too prohibitive:
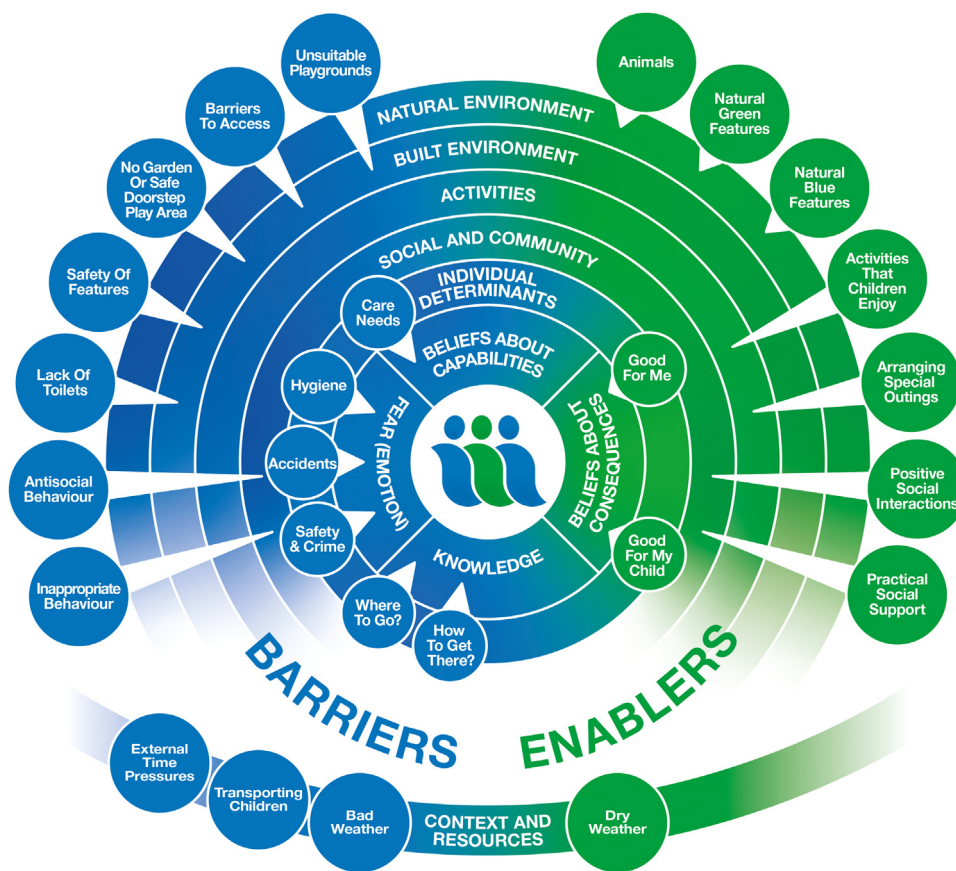
Fig. 1. Framework describing barriers and enablers to greenspace use for low income, multi-ethnic families.

"I think that's the main thing having areas that cause not everybody drives and it's hard for you to have a nice park if you don't have a nice park around your area and you can't drive and it's a shame that you can't get your kid to the park because you can't drive and you can walk but it's too far to walk" P8 *(Mum, Pakistani)*

3.1.4. Social and community influences

Social influences from family and other community members were both barriers and enablers to using parks and greenspaces. Many parents interviewed felt socially isolated, particularly those who were relatively new migrants to the area. Some parents had no family or friends nearby. Using greenspaces was an opportunity to meet other parents and children, to spend valued time with family and friends and to find opportunities to practice speaking English.

However some social interactions had their difficulties, for example, dads feeling they should avoid talking to mums in play areas in case they got the wrong impression; and some parents feeling they had to intervene when other parents were swearing in front of young children or encouraging children to push in when there was a queue for a swing or slide. One mum whose older child had a disability was put off visiting parks because other parents asked too many questions about the disability:

"85% people stare at you and ask what's wrong with her first. That's what I'm saying, that if we got this disability park facilities, I'm sure there's other parents will come and if there's four or five people on a chair she will not be left out and the people will not come only asking me what's wrong with her" P10 (Mum; Pakistani)

Direct experience of antisocial, threatening and dangerous behaviour of local people was an important barrier to using parks, for example:

"Quad bikes are a problem in the park, they're a real danger as well cause they are driving on the path at 30 mph and if he's [toddler] *running around its dangerous …"* P1 (Dad; white British)

Whilst there were examples of how other community members attempted to stop antisocial behaviour, for example intervening when teenagers were setting fire to swings, or stopping to save the life of a disabled man's dog attacked by another dog in the street, parents commented on the lack of police presence in parks to tackle antisocial behaviour, including vandalism:

"I just went in the park, in [park name], *and like the big children like 12, 14, 15 years old,* [set a] *fire in the park … on the swing seat … And it went black and people shout them and say don't do that…and they didn't stop and one more Asian man told them don't and they just shouting and they gone, they do it again"* P2 (Mum, Pakistani)

On the other hand, positive social interactions, and practical support by others were key enablers of park use. Many examples of practical support related to transportation, or finding parks, for example help from bus drivers:

"Most of the bus drivers will assume she's a foreigner will help her with some direction information …Yeah most of them, I'd say 90% of the drivers will do this, especially when they knew the people asking are foreign" P7 (Mum; Middle Eastern origin; Interpreter speaking)

Peer support between mums was also important:

"there was one girl, she was actually from Somalia I think, and she had a little girl and she got stuck, so I just helped a bit getting council things sorted, she's got a council house and stuff, but she didn't know what to do with the girls, so I started like showing her just go out with her, so we used to go on a weekend and she enjoyed it and now she's doing, she goes every day in the park, she's so changed" P4 (Mum, Western European)

3.1.5. Individual determinants

3.1.5.1. Fear (emotion).
Emotion, particularly fear, around protection of babies and young children in outdoor environments was a powerful barrier to using green spaces. Parents reported a range of fears including experiencing violent crime, antisocial behaviour (for example, quad-biking, intimidation from teenagers, fires) or fear about accidents and physical injury (e.g. stepping on glass, falling, drowning).

Fear of experiencing violent crimes such as shootings; sexual assaults and robberies in greenspaces was heightened due to the perceived isolation of the spaces where they would be responsible for not just defending themselves, but their babies too. These fears were often perceived or based on second hand information rather than direct experience, with peer pressure reinforcing avoidance of spaces:

Dad: "And you know even a lot of people in the community, local, they say don't go to that park"
Mum: They tell me don't go to this park
Dad: It's dangerous
Mum: Yeah, what kind of…
Dad: Drug dealing is going there, you know and there was some murderer or rapist or something" P3 (Mum and Dad; Pakistani)

Unfortunately some parents and children had witnessed events first hand, or been directly affected by violence. The murder of a young man in a local park the previous year had resulted in a decision from his ethnic group to stop their children of all ages playing outside and lament on the liberty the same children had in other countries they had lived in. It was not just the isolation of green spaces therefore that posed a threat for parents but just being outside the safety of home itself:

"I don't think this place, this area is safe at all, this area is not safe, we've had stabbings, we've had gun shots, we've had fights, we've had drug dealing and I don't think this is an area, well this street, I don't think I'd allow my child to play on these streets…" P11 (Mum, Pakistani)

Other fears were clustered around accidents such as falling in polluted water sources, broken glass, dog bites, horses, and hygiene issues such and dog excrement getting on shoes and in pushchair wheels. Parents felt they couldn't let their children run free on grass because they couldn't spot glass or dog excrement. Hygiene was also an issue for some, such as the mum who was worried about young children putting things in their mouths.

P7 (interpreter speaking): "The park is dangerous for him. She is always caring about him and holding him and controlling him all the time, just walk around with him …She say that she doesn't let him touch anything because he could just get the leaves and put it in his mouth, you know babies they pick up anything and put it in his mouth" P7 (Mum; Middle Eastern origin; interpreter speaking)

3.1.5.2. Beliefs about capabilities.
Parent's beliefs around what young children were capable of in greenspaces had a significant influence over decisions of visiting them. A mother of a 5 week old baby said she could not take her baby to the park until she was 5 months old because the play equipment was only for children who could sit up. Another mother of a 5 month old felt her daughter was too young to enjoy the park:

"she won't be able to do anything in the park maybe. Well she can get the fresh air but other than that I don't think she'll be able to do anything? She can't crawl, she can't walk …" P15 (Mum; Other South Asian)

Although one mother reported walking up to five miles with a pushchair to go to a park, a maximum of 20 min' walk was reasonable for most parents, less if a toddler was walking it was raining or it was uphill.

3.1.5.3. Beliefs about consequences.
Parents recognised multiple benefits of being outdoors in green spaces for their children, and this was a key enabler to use. In terms of physical activity they noted they had the freedom to be active, run, climb, jump and hop. Being out meant their mood was improved and they slept better when they were home. In terms of social and emotional health they saw their children are happy, busy and have the freedom to run, find, feel and explore new things. Some parents talked about a noticeable improvement in their child's mood if they were regularly taken out. The relative quietness of green spaces and distraction of nature was seen as having a calming effect on infants:

"well he's certainly happier outside… he was about one in the summer and in the garden he was much more chilled out than in the house … it definitely does seem to have a soothing effect for him just being outside" P1 (Dad; white British)

Parents also believed there were multiple benefits of greenspaces for themselves. These included believing greenspaces are 'restorative', good for eyesight, allow them to be more active, access fresh air, and improves their mood. They also felt happy to see their children happy. Being out with a baby or young child made strangers more likely to stop and talk to them. One, who experienced depression, noted her change in mood by regularly going out of the house, not just to greenspaces:

"I have depression, I like the plant, to go in the garden, do you understand? I want to go park, to the school, dropping, picking up. I want to go out. I am very bored…. I am looking people and my mind is fresh then and the day is very fast going…Normally I am very quiet but here I am talking to people so it is good for me" P3 (Mum; Pakistani)

3.1.5.4. Knowledge.
Lack of knowledge about where to access appropriate, safe greenspace was a key barrier to use. Even parents who had grown up in the local area did not know necessarily know where their local greenspaces were. Barriers to exploring local areas included distances, unfamiliarity of streets and/or bus routes, fear of getting lost. Knowledge of what areas people were permitted to access, especially for people new to the UK was also a worry:

"Well he just don't like to break the law, to go anywhere private, probably he thinks there a guard dogs or something which he could run into" P4 (Mum speaking about Pakistani husband)

3.1.6. Context and resources

The constraints of managing everyday day family life with young children was a barrier to visiting greenspaces in between multiple nursery and school drop offs, play groups, household chores, and hospital appointments. Ensuring the wellbeing of young children in terms of feeding, sleep, toileting, keeping them warm and dry in outdoor environments was an additional challenge compared to older children. In addition there were the commitments of older siblings such as after school activities and Mosque school:

"No I can't go because when they go school and nursery I just need to do home things like cooking, cleaning, like these things and err, she had a lot of appointments … that's why I erm, I am really really busy in time with her" P2 (Mum; Pakistani)

Transporting young children, who cannot yet walk independently or who are likely to fall asleep proved a challenge. Taking a baby to a park may not be the stimulating experience some parents hope for if they are asleep. Sleep was sometimes induced by the transport to the park. Young children being tired or irritable was also a barrier:

"if they, your child's not had a proper sleep they're going to be moody, it doesn't matter what you do, where you take them, they will be moody, you know, and they will not have any of it, they will not smile, even a park wouldn't even make them excited or something, you know" P11 (Mum; Pakistani)

Parents were mindful of young children's need to eat more frequently, and ensured snacks were available on their outings. They reported few or no facilities for changing nappies or hand washing outdoors, and toileting was an issue, especially when a child had multiple clothing layers on in winter. The British climate was also a barrier to greenspace use, although surprisingly cold weather was seen as less of a barrier than wet weather, with rain being a barrier all year round. Waterproofs and warm clothing were felt to restrict their ability to move and be agile. Keeping a baby or toddler warm and dry was seen as challenging. Many of the parents also expressed beliefs around very young children getting ill if they got cold and/or wet:

"I just feel that if I end up taking him out he could get ill or I could end up getting ill and then I won't be able to care for him as much as I can when I'm not ill" P11 (Mum; Pakistani)

Physical and mental health was also an issue for many. Increased occurrences of respiratory and gastrointestinal infections for both parents and children added to barriers experienced during winter months. Mental health issues, particularly for asylum seekers and refugees who may have experienced, or are still experiencing trauma were also apparent. There could be no more poignant reminder of this than the experience of one parent, an asylum seeker from a war torn country, who informed the interviewer that three close family members had been killed back home the morning of the interview. A trip to the park was not one of her priorities at this time.

4. Discussion

The aim of the current study was to explore determinants to greenspace use amongst a multi-ethnic sample of families with children aged 0–3 living within a deprived, urban area. We found wide variations in use of greenspace amongst our participants, but that families generally valued green spaces as positive for them and their children. A range of individual, social, and structural barriers were identified, and it was striking that these perceived barriers and enablers to greenspace use were common across our diverse multi-ethnic sample.

Fear about safety and crime were a major barrier to greenspace use in the current multi-ethnic sample, in line with previous research (CABE Space, 2010). Fear calls strongly on the protective instincts parents have for very young children, and was the most pervasive and distressing barrier reported in the current study. Many parents had experienced anti-social behaviour, and at worst, serious violent crime.

Crime creates a vicious circle where legitimate users visit greenspaces less, which then creates more conducive environments for crime and antisocial behaviour, making them dysfunctional spaces. Previous research has highlighted relationships between the design of greenspaces and crime (Kimpton et al., 2017). When developing new greenspaces consideration should be given as to how the structure of the greenspace may help or hinder feelings of safety, avoiding hidden and isolated spaces. In the current study, parents identified a range of factors which would make them feel safer using green spaces, including closed circuit television (CCTV), and increased police presence. But where directly addressing crime and antisocial behaviour was not felt to be feasible, parents suggested encouraging greater use of the park by local community groups, thereby helping the community to reclaim dysfunctional greenspaces for their own use.

Despite fears about safety, parks and greenspaces were often seen as areas of opportunity for social interaction, and practical support offered by friends, family and other service providers were key enablers to use. Parks offer opportunities for a wide variety of social interactions which can provide relief from daily routines, strengthen feelings of community cohesion, and provide opportunities for bonding within, and across peer or ethnic groups (Cattell et al., 2008). For immigrant families, parks can be safe places which allow them to develop relationships with new friends and acquaintances, orexperience 'family-bonding' opportunities (Hordyk et al., 2015). By providing opportunities for people

from different ethnic groups to interact in informal ways (Neal et al., 2015) what can start as spontaneous encounters between people in open spaces, can be cemented into ongoing friendships and social support (Cattell et al., 2008). Thus, initiatives to encourage such interaction in open spaces should offer a range of informal activities that communities can be involved with (Rishbeth et al., 2018). Practical support (for example, from peer mentoring, or community support groups) to help immigrant families access nature has also been highlighted as an important factor in encouraging greenspace use by other researchers (Hordyk et al., 2015). In the current study parents felt a number of activities would be welcomed including walking groups, organised activities with children, gardening events and litter picking events.

Lack of knowledge of local geography was an important barrier for our parents, and is likely also to be an issue for other areas with transient populations. At a very basic level, information about where local parks are and how to travel to them are vital pieces of information for new community members. Beliefs about capabilities, combined with the challenges of competing demands on time, and the inclement British weather were all identified as barriers to use. Parents identified challenges of protecting the wellbeing of babies and toddlers outside the facilities of home, including feeding and toileting, particularly in winter. Within the UK, green spaces are used much less in winter months, particularly amongst ethnic minority groups (CABE Space, 2010; McEachan et al., 2018). Some ethnic groups are influenced by humoral medical beliefs which link cold and humidity to respiratory disease and fevers and impact on willingness to expose very young children to the outdoors throughout the year (Cronin de Chavez et al., 2016). Many parents, particularly of South Asian, Eastern European and African ethnicity reported their concerns about the link between cold temperatures and respiratory conditions in the current study.

A range of built environment factors were identified as barriers to greenspace use. As well as the availability of quality and safe greenspaces, the actual physical accessibility of these spaces was important. In some parks access restrictions at gates to discourage antisocial behaviour (e.g. quad biking) inadvertently meant that parents couldn't access spaces with pushchairs. This highlights the necessity of community co-production into decisions about local greenspaces to ensure that suggested improvements do not have unintended consequences for others. Co-production might also help to increase use of greenspaces amongst communities. A recent systematic review found that interventions to increase use of greenspaces involving the community in co-designing changes were more effective than those which did not include community members in their design (Roberts et al., 2018a). A range of techniques to facilitate this type of co-production exist incorporating principles of citizen science (e.g. King et al., 2016) and participatory mapping (e.g. Haklay and Francis, 2018), these methods share in common the essence of doing things with communities, rather than 'for' or 'to' them.

Exploring barriers to greenspace use through the lens of the Health Map and the TDF has been valuable in gaining a more nuanced understanding of the complex interplay between both structural and personal determinants of use. Neither framework was on its own sufficient to explain determinants of greenspace use amongst our sample, for example, the TDF was less able to describe the structural influences of greenspace use, with particular reference to the built and natural environment. Conversely, the Health Map lacked the necessary detail with which to identify precise individual factors which influenced behaviour. Social and community influences were common threads which allowed integration of the two models. Efforts to change behaviour often fail because intervention developers tend to prioritise individual agency and disregard the contextual, economic and political drivers of behaviour (Kelly and Barker, 2016). Within the public health arena there have been recent calls to explicitly recognise the complex, interdependent, and interactive relationships between structural (also referred to as systems) and individual determinants of behaviour

Box 2

Recommendations to increase green space use.

– Structural interventions to improve local green spaces focus on making spaces safe and attractive for families with young children to visit
– Targeted communications and activities are implemented which aim to encourage families to use their local green spaces. These should include:
  ● Providing families with information on where local green space are, how to get to them, and what relevant activities can be engaged in with young children in these spaces
  ● Leading and/or facilitating community events in local green spaces to encourage social support and increase community ownership of local green spaces
– Consideration is given as to how all interventions will impact on, or be impacted by crime and anti-social behaviour and how interventions will impact on the needs of different park user groups, including adolescents and young adults
– That interventions and activities are co-produced with members of the local community in order to ensure acceptability and feasibility.

(Sniehotta et al., 2017). By integrating two popular models of health determinants we are able to provide policy makers with a clear set of targets for interventions ranging from structural to individual factors. Efforts to increase greenspace use amongst low-income, multi-ethnic groups will require concerted efforts at a range of levels; it is clear that simply focusing efforts on encouraging individuals to use these spaces without trying to tackle the inherent inequities apparent in the quality, safety and reputation of spaces for these groups will not be enough.

4.1. Strengths and limitations

The current study had a number of strengths. It is, to our knowledge, the first to explore in detail barriers and enablers to greenspace use amongst low income, multi-ethnic families with young children. Our paper is thus an important contribution to this field of research. We included a diverse multi-ethnic sample of parents, living in areas of major deprivation. 'Poorly accessed' groups (sometimes also referred to as 'hard to reach') were well represented in the current study, including those who were not able to speak English and those from migrant communities. Our success in recruitment was predicated on building trusting relationships with 'gatekeepers' to these communities, and it took substantial amounts of time and effort to build these relationships. Despite being a diverse group, reported experiences were very similar. This increases our confidence that our findings will be of relevance to other multi-ethnic urban areas in the UK. We hope the current study will help to stimulate debate about how to offer equitable opportunities to improve health and reduce inequalities through the use of urban greenspaces.

There are a number of limitations. Our sample was predominantly female, with the majority of mothers not in employment. Although this reflects the demographic of parents caring for young children in our study area, we are aware that barriers to greenspace use may be experienced differently by working parents, and by male parents/carers. Similarly, we do not know whether the experiences of our sample of parents might be similar to non-parents, parents of older children or other community members. No one group uses local greenspaces in isolation and in order to effectively implement interventions to increase use it will be important to hear perspectives from all community members. Future research should aim to assess the replicability of our framework with other community groups. We used a combination of inductive and deductive analyses, but we did approach our analysis with an a priori conceptual framework combining socio-ecological and individual frameworks for explaining behaviour. This was a pragmatic choice in order to maximise the utility of our findings, and to allow them to be contextualised within a wider body of public health evidence using common language and shared terminology. However, we recognise that alternative approaches to analyses are possible and useful.

4.2. Policy and practice implications

We present our framework of determinants in Fig. 1. We hope that this framework will aid urban planners and public health professionals to identify key targets for intervention to promote greenspace use. It is recognised that interventions need to combine structural changes to improve quality and accessibility, with activities targeted at communities to increase use (WHO Regional Office for Europe, 2017). Our framework can be used to inform the content of such interventions, for example, highlighting important areas to focus on which can be further developed via co-production with communities and key stakeholders. Based on our findings we suggest a number of recommendations to increase greenspace use amongst low income, multi-ethnic families. These are outlined in Box 2. A full list of suggestions offered by participants can be found in Supplemental file 1.

5. Conclusion

Greenspaces are an important population health resource with the potential to reduce health inequalities. Whilst their importance is recognised, low income families living in multi-cultural deprived urban areas, can experience such a multitude of barriers to using and enjoying these spaces to the extent that they can become 'no go' areas. It is vital to recognise that even well-maintained, attractive greenspaces may adversely affect physical and mental health if they are perceived as frightening, or as places which pose a danger to safety (whether real or imagined). In deprived areas there is a need for communities to be empowered to reclaim dysfunctional greenspaces and reinstate their status as community assets rather than areas to be avoided. To 'level the playing field' in favour of communities in most need, multi-sectoral efforts (including urban planners, public health professionals, community organisations and local businesses) are needed to co-produce and implement interventions to overcome structural, social and personal barriers to use. Improving quality of greenspaces combined with encouraging community ownership will be crucial in this endeavour. More research is needed to identify the most effective ways of co-producing interventions to increase greenspace use among multi-ethnic groups, and to evaluate their impact on health and health inequalities.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.healthplace.2019.01.018.

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