Socio-environmental influences on physical activity among young people: a qualitative study

Joanna Kirby1*, Kate A. Levin2,3 and Jo Inchley2

1Division of Health Sciences, Warwick Medical School, University of Warwick, Gibbet Hill, Coventry CV4 7AL, UK, 2Child and Adolescent Health Research Unit (CAHRU), School of Medicine, University of St Andrews, North Haugh, St Andrews, Fife KY16 9TF, UK and 3Ludwig Boltzmann Institute for Health Promotion Research, Vienna, Austria

*Correspondence to: J. Kirby. E-mail: j.l.m.kirby@warwick.ac.uk

Received on November 9, 2012; accepted on July 10, 2013

Abstract

This multi-methods qualitative study aimed to identify environmental factors that influence physical activity participation among young people in Edinburgh, Scotland. School pupils (aged 11–13 years) took part using photography, computer blogs, maps and focus group discussions (FGDs). Eleven computer sessions (n = 131) and 14 FGDs (n = 63) took place. Factors influencing physical activity behaviour included proximity and access to local facilities, family and peers and the school physical activity environment. A variety of facilitators and barriers to participation were also reported. Most notable was the importance of cost and value for money when choosing physical activities which, although more evident among pupils attending schools in areas of low socio-economic status (SES), was relevant across all SES groups. Reporting easy access to sports facilities was more common among pupils attending schools from high/medium SES. Use of green-space for physical activity was reported among pupils from all schools, but was more common among those from low SES schools. Pupils were, in general, satisfied with the facilities available at school, but felt time for physical education could be increased. Findings may help inform interventions, aimed at promoting physical activity at local level.

Background

Physical inactivity among young people is a risk factor for cardiovascular disease, cancer and osteoporosis in later life [1], as well as increased body mass index and obesity [2, 3]. An environment that limits physical activity has been implicated as a major contributing factor in the obesity epidemic [4, 5]. Rising levels of childhood obesity have been attributed, in part, to environmental changes including increased use of motorized transport and decreased opportunities for recreational physical activity [1, 6]. Scottish data show that, among 13- to 15-year olds, 75% of boys but only 48% of girls meet current recommended guidelines of 60 min physical activity a day, 7 days a week [7]. Furthermore, among 12- to 15-year olds, 34.8% of boys and 36.3% of girls are outside the healthy weight range [8]. Physical activity has therefore been a key focus of health promotion efforts among children and adolescents [9].

Socio-ecological models highlight multiple levels of influences on behaviour and have been used to investigate determinants of children’s physical activity [10]. These models propose behavioural influences which include individual (e.g. beliefs about physical activity), social (e.g. peers and family) and physical environmental factors (e.g. neighbourhood design). A social ecological approach provides a conceptual framework for informing...
the development of intervention strategies that target changes beyond the individual level [11]. To reduce obesity and its co-morbidities, interventions must embrace an understanding of community-level factors including the social, built and natural environments [12, 13].

Understanding how a young person’s environment may impact on physical activity is complex. Schools offering organized non-curricular physical activity several times a week showed a higher proportion of pupils reporting daily participation in recess physical activity [13]. However, another study showed no association between school sports facilities and increased physical activity [14]. Greater access to neighbourhood recreational facilities can facilitate young people’s physical activity [15]. Similarly, proximity to greenspace has been associated with physical activity, after adjustment for respondent and neighbourhood characteristics [16]. Potentially more important than proximity to, or density of, facilities and resources is the degree of personal and social significance placed on these [17]. The importance of friends and family in relation to developing a sense of place and how this shapes young people’s experience in physical activities has been demonstrated [18].

The association between socio-economic status (SES) and obesity is well documented [19], highlighting the need to reduce obesity rates among young people of lower SES. Mother’s education level and family income have also been shown to be independent correlates of adolescents’ physical activity [20]. Those in less affluent families may be more restricted in their choices and opportunities, particularly during adolescence when physical activity may involve more financial costs (e.g. club memberships) compared with informal play [20]. In Scotland, a significant association between area deprivation and density of physical activity facilities was shown [21] suggesting access to opportunities may be more restricted among deprived communities.

Increased emphasis is being placed on using qualitative methods in developing an evidence base for public health [22]. Using a multi-method qualitative approach to explore young people’s experiences is valuable in offering complementary insights and understanding that may be difficult to access through reliance on a single data collection method [23]. Multi-method studies exploring young people’s perspectives in relation to environmental influences on physical activity have, to date, been limited [23, 24]. By adopting a broader environmental approach, grounded in socio-ecological theory, this study aims to explore context-specific factors which may affect young people’s physical activity levels within an urban setting. This article reports findings from the ‘Young People, Physical Activity and Food Choices Study’, which aimed to explore the influence of the environment on young people’s physical activity, eating behaviours and food choices within the local environment of Edinburgh, Scotland. More specifically, the study set out to identify socio-environmental factors that influence choices young people make in relation to their diet and physical activity to help inform development of interventions, aimed at promoting active living and healthy eating. This article presents data on physical activity and specifically: (i) the range of opportunities to be physically active within the local environment, (ii) facilitators and barriers to being physically active, (iii) the influence of family and friends and (iv) the school environment.

**Methods**

A multi-method qualitative approach was used, including maps, photography, computer blogs and focus group discussions (FGDs). The research was undertaken within six secondary schools in Edinburgh, Scotland. Permission was sought from the local education authority and school management. Ethical approval was gained from Moray House School of Education, University of Edinburgh ethics committee. In accordance with standard ethical guidelines and requirements of individual schools, pupil and parental information sheets and consent forms were issued to all potential participants prior to data collection.

Percentage free school meal entitlement [25] was used as an indicator of school-level SES. Based on
distribution levels, secondary schools were categorized as high, medium or low SES. There are 23 local authority secondary schools within Edinburgh, and 12 independent schools. All 35 were invited by letter to take part. The first two schools to volunteer from areas of high, medium and low SES, respectively, were recruited. Participants were from first (S1) and second (S2) years of secondary school (11–13 years).

Data collection

A minimum of three visits were made to each school; first, to introduce the study and initiate the photography exercise; second, to oversee the computer session and third, to carry out the FGDs. At initial recruitment, one S1 and S2 class (first and second year of secondary school) per school were asked to take part in the photography exercise and computer session. The class and lesson were both chosen by each school based on convenient times for the research to take place within their timetable. As such, lessons used included Information Technology, Home Economics, Health Education and registration (independent school only). Data collection took place November 2010–March 2011.

Photography/computer blog

The photography exercise was introduced to the class by the researcher at the first visit. The number of pupils taking part in each computer session was dependent on the class size, but ranged between 9 and 18 consenting pupils. Using mobile phones, digital or disposable cameras, pupils were asked to take photos representing aspects of the local environment relevant to their physical activity behaviours. Children’s self-directed photography has proved an insightful method for capturing aspects of their everyday lives [26], with use of more experimental forms of participatory visual research (e.g. digital cameras) being promoted [27]. The use of mobile phones or digital cameras was encouraged in the first instance. However, disposable cameras were supplied to pupils without access to these. A minimum of 2 weeks later, pupils took part in the computer session to produce, using a word processor, a ‘blog’ incorporating their photos and describing their physical activity behaviours. The researcher was present to provide guidance if needed; however, the title, structure and content were left to the discretion of each participant. To remain inclusive, those without personal photos on the day (i.e. those who had not taken photos in the allocated time frame or brought their photos to the lesson, or those who had trouble uploading their photos to the computer) were given the option of using Google images. As demonstrated in Table I, 8 pupils used their own digital photos, 1 used photos from a disposable camera, 112 used Google images, 6 used a mixture and 4 used text only.

Focus group discussions

Small \((n = 4–5)\) single-sex groups, including friendship pairs, were used. At the time of the first visit, pupils were asked by the researcher to write down on a pre-prepared form, the name of two same-sex friends they wished to be paired with in the FGD. The researcher then selected forms at random, ensuring that at least two friends were in the same focus group. Including friendship groups allowed for a degree of homogeneity, thereby creating a more relaxed setting and capitalizing on shared experiences [28]. Ensuring that children feel comfortable and confident in a FGD is important. This is particularly relevant when the topic being discussed, in this case physical activity (and food choice), focuses on personal behaviours, Lewis [28] argues that friendship groups have already passed through the early stages of group behaviour, thus facilitating the free expression of ideas. Homogeneity relating to gender is recommended when conducting focus groups with children [29], particularly in secondary school years where single-sex groups can result in richer data [30]. In this study, each FGD \((n = 14)\) began with a mapping exercise [31]. Participants were given a local area and city map and asked to mark where they were physically active. Maps stimulated discussion and provided an extra source of data. FGDs were semi-structured and focused around a standard set of questions (Table II). Questions were guided by a socio-ecological approach.
and based around previous literature [10, 32, 33]. Topics were left broad and open to allow for unrestricted discussion. A selection of images was also used to help stimulate thoughts and ideas.

All FGDs (30–40 min) were facilitated by one researcher and carried out in a quiet location within the school. With pupil permission, discussions were recorded using a digital voice recorder, and pupils were given an assurance of confidentiality.

Data analysis

The interview schedule and coding schemes were guided by previous literature [32, 33] and a pilot study on walking behaviours previously carried out by the researchers [31], incorporating social, environmental and personal factors known to influence behaviours. Audio recordings of FGDs were transcribed. All transcripts were analysed thematically [34]. Within content analysis, the application of themes across datasets enables a ‘systematic overview of the scope of the data’ [35] and facilitates comparisons within and between groups. Analyses were guided by four key themes: places/facilities for being physically active, facilitators and barriers, social influences and school environment. These themes were derived from the semi-structured interview schedule (Table II), and an initial coding framework was developed within Nvivo 8 software. Common and recurring descriptive and explanatory sub-themes within these were then identified, drawing on concepts identified when developing the semi-structured interview schedule and those which presented themselves on inspection of the data. If new sub-themes appeared in later transcripts, earlier transcripts would be re-read to check for any additional data falling within this sub-theme. Coding was hierarchical, with variation in a given theme being coded under sub-headings. These

<table>
<thead>
<tr>
<th>Table I. Type of photo used by gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of photo used</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Own digital photos</td>
</tr>
<tr>
<td>Google/C images</td>
</tr>
<tr>
<td>Disposable camera photos</td>
</tr>
<tr>
<td>Mixture (disposable/digital and Google images)</td>
</tr>
<tr>
<td>Text only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table II. Main areas explored in FGDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mapping exercise (10 min) followed by key questions</td>
</tr>
<tr>
<td>Places/facilities for being physically active in the local environment</td>
</tr>
<tr>
<td>- Using the map, can you describe the types of physical activity you do and where you do them?</td>
</tr>
<tr>
<td>- In a typical week what kinds of physical activity or sports do you do?</td>
</tr>
<tr>
<td>- Using images—which of these best represents the types of physical activity you do and places where you are physically active?</td>
</tr>
<tr>
<td>- Do you have facilities near where you live or at school where you can be physically active?</td>
</tr>
<tr>
<td>- What are your favourite places for being physically active?</td>
</tr>
<tr>
<td>- Do you use [specify local facilities/areas]?</td>
</tr>
<tr>
<td>- Why do you choose these places to be active and not others?</td>
</tr>
<tr>
<td>- Do you have open spaces where you can be physically active?</td>
</tr>
<tr>
<td>- Do you feel safe doing physical activity in the area where you live/near your school?</td>
</tr>
<tr>
<td>Social influences on physical activity</td>
</tr>
<tr>
<td>- Who mainly makes decisions about where and when you are physically active?</td>
</tr>
<tr>
<td>- Who are you physically active with?</td>
</tr>
<tr>
<td>Facilitators/barriers to being physically active</td>
</tr>
<tr>
<td>- How easy is it for you to be physically active in your everyday life?</td>
</tr>
<tr>
<td>- Is there anything which stops you from being physically active?</td>
</tr>
<tr>
<td>- What would be your ideal place to do the activities you would like to do?</td>
</tr>
<tr>
<td>- What would make it easier for you to be physically active?</td>
</tr>
<tr>
<td>School physical activity environment</td>
</tr>
<tr>
<td>- Do you do much physical activity at school?</td>
</tr>
<tr>
<td>- What facilities do you have to be physically active at school?</td>
</tr>
<tr>
<td>- What would make it easier at school to be more physically active?</td>
</tr>
</tbody>
</table>


sub-headings could be further divided if required, for example, ‘cost’ being a sub-theme to ‘barriers’, itself a sub-theme of ‘physical activity’. In particular, similarities and differences across locations (school and SES) were explored. Codes were checked for consistency by one other researcher who had access to transcripts, photos and maps, but who was not involved in data collection. For presentation of results, each theme is discussed separately.

Maps were coded using criteria in relation to places/facilities for being physically active (e.g. distances travelled), social influences (e.g. people physically active with) and school environment (e.g. on-site/off-site facilities). Hard copies of blogs were scanned and imported into NVivo software for analysis, and the coding scheme was applied systematically, focussing on types of photos used and themes emerging from accompanying text.

Results

Six secondary schools in Edinburgh took part (Table III). Edinburgh is located in South-East Scotland and is the second largest city, accounting for 9.4% of the Scottish population [36]. All six schools were classified as being in a large urban area according to the Scottish Household Survey 2008 6-Fold Urban-rural Classification [37].

Across the six schools, 63 pupils (32 boys, 31 girls) took part in 14 FGDs. Eleven computer sessions (across nine classes) with 131 pupils were completed (Table IV).

The following results describe pupils’ views in relation to the four key themes as expressed through images, blogs, maps and FGDs.

Places and facilities for being physically active

Pupils named a comprehensive list of places used for physical activity within their local environment. Swimming pools and football pitches were regularly reported. Others included council leisure centres, private gyms, community centres, school sports facilities and playing fields, club and council tennis courts, greenspace, astroturf, basketball hoops, car parks and local streets. Using the maps pupils had annotated during the FGDs, both boys and girls, commonly described using areas close to home or school, particularly if friends lived nearby.

I go swimming in [town] baths. And there is a basketball net in the park so I play basketball there. I play football with people round my bit. (School C, S2 girl)

There is a park there where I play football. And also a car park near my house where I play football. (School C, S2 boy)

Specific facilities, such as a 50 m swimming pool, large sports centre and dry ski slope were described by some participants from high/medium SES schools, as places they used, but less frequently.

No, it [large sports centre] is quite far away. I go there every second week. (School A, S2 boy)

The 50 m swimming pool, located 2 miles south of the city centre, provided much discussion, with pupils from all schools reporting using it. The pool was under refurbishment and pupils discussed how it was a facility they missed. The maps demonstrated how young people used a mixture of facilities close to their home and further away, depending on activity type. Figure 1 demonstrates specific areas used by one pupil, including a local park near to home and school, as well as football pitches and a sports centre further away. Proximity was a key issue and the importance of having facilities available within the local environment was reported across pupils in all schools.

[Dry ski slope] is important to me because it’s the nearest place to me [for skiing] and other ski centres are in Glasgow and are far away. (School B, S1 boy)

Sometimes [use other pool] but I am within walking distance of the pool at [town] so I just go there. (School C, S2 boy)

While FGDs and maps provided information about places where young people were active, the
blog yielded a high proportion of images representing ‘types’ of activity rather than ‘where’ these took place. Of a total of 225 photos/images representing physical activity behaviour, 202 related to ‘types’ of activity and 23 related to ‘where’ the activity took place. For example, pupils presented images of kits they used for an activity (Fig. 2).

Local greenspaces were commonly reported as a place to be active, or simply ‘hang out’ with friends. Local greenspace where young people could be active with friends was reported across all SES groups.

I like [greenspace] a lot. We [friends] go there in the summer and play in the river. It is the centre of where everyone is. So everyone can go there and meet up. (School D, S1 girl)

Greenspace was almost always discussed in conjunction with spending time with friends, and provided not only an area to be active but also a sense of local identity and social connectedness. Pupils from School F described using a particular greenspace, mentioned regularly in FGDs, blogs (Fig. 3) and on maps. Participants clearly felt a strong connection to this local space.

Availability of facilities in the local area was important for all pupils, but there were differences in the types of activities carried out by boys and girls, which in turn highlighted some differences into their satisfaction with what was available to them in their local area. Boys more commonly reported playing football, martial arts and biking, whereas girls were more likely to report basketball and dance, as well as walking. Swimming was common across both genders. Availability of local sports facilities was variable across SES groups, with those from high/medium SES schools more commonly reporting facilities nearby than those from low SES schools. It is important to note, however, the high/medium SES schools were more centrally located, potentially impacting this observation.

Interviewer: Is there anything in your local area you’d like that you don’t have?
Boy A: A swimming pool
Boy B: We’ve got [leisure centre] though

<table>
<thead>
<tr>
<th>School type (SES)</th>
<th>School location</th>
<th>% free school meal entitlement</th>
<th>On-site facilities</th>
<th>Off-site facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A Independent</td>
<td>Central: second quintile (0%)</td>
<td>Two gyms, Swimming pool, PE staff also use playground and schools lawns. Plans underway for a new sports hall.</td>
<td>Large local area of greenspace and own offsite sports pitches located a couple of miles from school. Numerous offsite facilities, including local playing fields, public sports centres, and tennis club.</td>
<td>Local community centre, local primary school, local leisure centre and community sports centre.</td>
</tr>
<tr>
<td>School B State (High)</td>
<td>South: fifth quintile (4%)</td>
<td>One games hall and gym. Assembly hall also used for some activities.</td>
<td>Games hall, gym hall and swimming pool. Assembly hall also used for some activities.</td>
<td>Local parks, local sports centre and community swimming pool.</td>
</tr>
<tr>
<td>School C State (Medium)</td>
<td>North East: fourth quintile (12%)</td>
<td>Games hall, gym hall and swimming pool. Assembly hall also used for some activities.</td>
<td>Games hall, gym hall and swimming pool. Assembly hall also used for some activities.</td>
<td>Local community centre and public park.</td>
</tr>
<tr>
<td>School D State catholic (Medium)</td>
<td>North: second quintile (9%)</td>
<td>Games hall, gymnasium and fitness suite.</td>
<td>Games hall, gymnasium and fitness suite.</td>
<td>Local community centre and public park.</td>
</tr>
<tr>
<td>School E State (Low)</td>
<td>South East residential area: fifth quintile (18%)</td>
<td>Large games hall, two smaller indoor gyms, fitness rooms, large playing fields, and school tennis courts.</td>
<td>Large games hall, two smaller indoor gyms, fitness rooms, large playing fields, and school tennis courts.</td>
<td>Local leisure centre and community sports centre.</td>
</tr>
<tr>
<td>School F State (Low)</td>
<td>North: second quintile (17%)</td>
<td>Games hall, fitness gym, dance-studio, astro turf, football/rugby pitches, and cricket square.</td>
<td>Games hall, fitness gym, dance-studio, astro turf, football/rugby pitches, and cricket square.</td>
<td>Local community centre and public park.</td>
</tr>
</tbody>
</table>

*2009 Scottish Index of Multiple Deprivation, where the first is least deprived and the fifth is most [38].
Boy A: Aye, but that’s way up there
Boy B: True
(School E, S1 boys)

Participants from high/medium SES schools discussed being driven to sports facilities further away which may have influenced their perceptions of ease of access.

I also go to tennis at [place name], just every Friday... after pipe band... no, it is far away. I get a lift from mum. She takes me there after school and I get changed when I get there.
(School A, S2 boy)

Social influences on physical activity

Family and friends exerted both positive and negative effects on physical activity. Young people commonly reported being active with a parent.

So then I suppose [go walking] Arthur’s seat and the beach with my mum, with the dogs as well. (School E, S2 girl)

However, being active with parents was not always seen positively, with some describing how they preferred to be active with friends. Some reported doing activities with parents when younger, or feeling embarrassed being active with parents now.

I used to go cycling wi’ my mum. But then I got embarrassed. I just went myself. Like, cause she couldn’t keep up cause I used to be like, I think the furthest one was like ten kilometres... I’m embarrassed. My mum’s like ‘wait up’. (School E, S1 boy)

Parental safety concerns could act as a barrier to some young people being active, with some parents not allowing their children to go out by themselves.

I have two sisters so they sometimes go ‘do you want to go for a walk?’... my mum says ‘oh you can’t go on your own’ and I don’t particularly want to go on my own so that stops me [being active] sometimes. (School A, S1 girl)

However, parents were also reported as discouraging sedentary behaviour within the home.

My mum got me, what was it, X-box Live [games computer], but she said ‘You’ll no’ be going on that much ‘cos I dae want ye turnin’ out a fatty. (School F, S1 boy)

Being active with friends was common among both genders, particularly team games such as football (boys) or basketball (girls). Living close to friends was reported as a facilitator and being with friends was a positive aspect of being active. Young people discussed how they would go to local areas with friends to take part in physical activities and how friends might help encourage them to leave the house.

If a friend asks me to come out we just walk about the park and run about and stuff. (School C, S1 girl)

[We go to] the park to play football. There is about six, seven, eight of us in the area. Then we walk to get each other. (School A, S2 boy)

For young people who did not feel that they were very active, walking with friends was seen as helpful in increasing their physical activity levels (Fig. 4).

Table IV. Participants taking part in computer session and FGDs by school

<table>
<thead>
<tr>
<th>School</th>
<th>Computer (S1)</th>
<th>Computer (S2)</th>
<th>FGD (S1)</th>
<th>FGD (S2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>9</td>
<td>12</td>
<td>4 (girls)</td>
<td>4 (boys)</td>
</tr>
<tr>
<td>School B</td>
<td>12</td>
<td>18</td>
<td>5 (boys)</td>
<td>5 (girls)</td>
</tr>
<tr>
<td>School C</td>
<td>18</td>
<td>13</td>
<td>4 (girls)</td>
<td>4 (girls)</td>
</tr>
<tr>
<td>School D</td>
<td>16</td>
<td>18</td>
<td>4 (girls)</td>
<td>5 (boys)</td>
</tr>
<tr>
<td>School E</td>
<td>—</td>
<td>—</td>
<td>5 (boys)</td>
<td>5 (girls)</td>
</tr>
<tr>
<td>School F</td>
<td>15</td>
<td>—</td>
<td>5 (girls)</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>61</td>
<td>36</td>
<td>27</td>
</tr>
</tbody>
</table>

J. Kirby et al.

960
Can get friends who are lazy... aye, some, everyone will go ‘Let’s go to the [astroturf] and then one’ll go ‘Aw, I cannae be bothered. (School F, S1 boy)

Facilitators and barriers to being physically active
Ease of access and distance to facilities were common facilitators to being active. Figure 5 shows an example of how local facilities allowed for participation in particular activities.

Facilitators and barriers to being physically active
Ease of access and distance to facilities were common facilitators to being active. Figure 5 shows an example of how local facilities allowed for participation in particular activities. There were school-area SES differences concerning facility availability. Pupils from high SES schools reported having enough access to facilities. In contrast, those from low/medium SES schools...
were less likely to report easy access to a wide range of facilities, although access to greenspace was common among all groups. Pupils from School F (low SES) regularly reported using one area of local greenspace and had good access to football facilities. Across the whole sample, nine photos representing greenspace were used in computer blogs. Of these, four were of one specific area of greenspace used by pupils in School F. This area was also discussed by both boys and girls in the FGDs. Greenspace was commonly used for football among boys, although some girls reported this activity too, as well as just ‘hanging out’ with friends. One medium SES school was centrally located and pupils reported good access to facilities. However, in another area of medium SES, pupils suggested there were not enough local facilities or variety. A single venue where different activities were available was required. Although young people felt there were good facilities available in some parts of the city (e.g. new skate park), these were hard to access for those living elsewhere.

Pupil: There is that BMX park but that is miles away... a car journey away
Interviewer: None of you ever use that?
All: No
Pupil: There is a really small kind of skate park in [nearby town] but it is only really a ramp and a couple of rails and stuff
(School C, S2 boy)

A main barrier reported to being active in the local environment included cost and value for money and this was an issue discussed by both boys and girls. Some facilities, previously free at primary school (e.g. swimming pool), now had to be paid for, meaning attendance was less likely. Some felt that popular activities such as swimming should remain free throughout school.

[Swimming pool]... at primary school we used to go all the time because it was free but now we don’t go as much because we have to pay. (School D, S1 girl)

I think swimming pools should be free until you are 18. I don’t think there is much difference between primary and secondary... yes,
if you go [swimming] often, it should be free. (School D, S2 boy)

Reporting cost as a barrier was more common among those from lower SES. However, it was not exclusive to this group and cost/value for money was discussed by all. Cost was often dependent on the type of activity. For example, girls attending a school in high SES described how they enjoyed dancing but had to give it up due to the cost of new equipment.

I stopped dancing because it was really difficult and I didn’t have the right stuff and mum was like ‘we can’t afford it at the moment’. And it was like £50 for a pair of point shoes and for a leotard it was £30 and then for the tutu’s and stuff…I used to do ballet and things. And the teacher was like ‘you need to get this and you need to get that’ every week and it just added up too much so I had to give up. (School B, S2 girl)

For some, parents were described as being prepared to spend money on their child’s activities and preferred this to spending money on other things. In these cases cost was less of an issue.

She [mum] won’t give me a penny to go and get a sweet but she’d spend £100 on something to do with sports…she’ll be like, ‘I don’t mind how much it is as long as you are doing some physical activity or some sport’. I’m starting up surfing. I love it so much. (School B, S2 girl)

Some facilities were described as being good value for money. In particular, pupils at School F described an astroturf in their local area as a facility which did not cost too much money.

The [astroturf] is really good ‘cos that’s only £2 and it’s as long as you want…And [sports centre] is £1…it’s like an hour and a half or something. That’s how long usually play for. (School F, S1 boy)

Some described how they had a ‘leisure card’ and this could be used at local sport centres and other facilities run by the local council. This was thought to be good value. However, the distance required to travel to a sports centre if there was not one in the local area was seen as an additional cost which could be a barrier, most notable in pupils from low SES schools.

There should be a sports centre more near us ‘cause we have to go in the car. And someone that hasn’t got a car has to take the bus. And everything’s money. (School E, S1 girl)

Other barriers included a lack of time and having other commitments. For example, having too much homework, or activities taking place too late.

It [basketball club] was too late… I had too much homework. (School B, S1 boy)

I sometimes don’t go to hockey on Sundays. I go to church in the morning and then I have to go out and come back… and then get ready for dinner and stuff and there is always something else going on that we have to do so sometimes it is just better to miss it. (School A, S1 girl)

Another barrier, reported by girls, was feeling a lack of trust from sport centre staff and feeling unwelcome. This could cause difficulties for young people when using certain facilities such as gyms or swimming pools.

I don’t get it. It is really hard for people our age to use the gym. Because they [gym staff] don’t trust you or something. (School B, S2 girl)

As well as increased costs of facilities as pupils became older, there were also some restrictions in the available activities, either due to age or restrictions on the times they were able to use them.

I used to go there [leisure centre] but then I stopped because they didn’t have any physical activity for my age. They have a crèche which is for up to like 8 years old, then they had…the only thing they had for me was like a swimming pool. (School B, S2 girl)
School physical activity environment

The school physical activity environment was explored, in particular, provision of facilities (onsite/offsite), physical education (PE) and extracurricular activities. All but one school were reported as providing 2 hours of PE per week, in line with current recommendations. However, pupils reported that actual time spent doing PE was closer to an hour, once commuting to offsite facilities and getting changed were factored in. It was sometimes felt that time could be better spent walking to facilities, rather than using transport.

For some reason we got a coach there [swimming pool]...Would take us about 10 minutes, 20 minutes to walk. (School D, S1 girl)

However, use of offsite facilities was not necessarily a negative aspect to school PE and could lead to pupils using the facilities in their own time (Fig. 6).

With the exception of School A, who were happy with their PE time allocation (independent, high SES), all pupils felt they would like more PE. In some cases, boys and girls did PE separately. There was mixed opinion as to whether this was preferable or not. However, both genders agreed there could be negative aspects with regards to the activities made available to girls.

Naw [boys and girls are not together]. The boys like do football all the time and then sometimes the girls do it, but...aye, some girls like football. (School F, S1 boy)

...they [boys] got a chance to go outside and then, or...or be in the fitness suite. And we [girls] just, we got told we had to be in the dancing studios to repeat stuff that we’d already done. (School F, S1 girl)

In general, pupils were happy with school facilities. Some schools had onsite facilities, whereas others had to travel to offsite public facilities, or school playing fields elsewhere.

One class is always in the hall...there are some places [for PE] which are walkable like the [local park]. If it’s nice and sunny they’ll [teachers] take us to play rounders. (School B, S2 girl)

In areas with limited local public facilities, pupils felt schools should have facilities they could use outside school hours.

I’d like more [facilities]. There is two gyms hereabouts...but it would be better if there was one at school because it is quite easy to get to and everybody knows where it is. (School C, S2 boy)

In some cases, pupils felt their PE experience would be better if school changing facilities were improved. Extra-curricular sports/clubs were available across all schools with pupils in all FGDs reporting to have access to these. Pupils who reported taking part in a school clubs sometimes reported practising the same activity in a community club, e.g. local football/basketball club and dance studio.

The journey to and from school was described as a time when pupils could be active through walking. Maps showed the school building and sports facilities as areas where physical activity took place, and routes for walking to school. For some, particularly from School C (a large building with many stairs), walking around school was regularly described as part of their physical activity routine. Figure 7 shows how one pupil uses the blog to describe their journey to school and how the school building provides opportunities to be active.
Discussion

This study investigated socio-environmental influences on young people’s physical activity. Such information is important in designing effective interventions which target specific populations and their needs. The study showed variation across the city in reported availability and accessibility of facilities to be active, with more favourable reporting among those attending higher SES schools. This may reflect the availability of transport and funds among higher SES children, enabling access to costly or distant facilities and enlarging the boundaries of perceived ‘local’ area and what is available within it. Alternatively, it may be that ‘symbolic proximity’ rather than actual proximity [17] is a factor, whereby young people are only aware of or perceive facilities that would be ‘for them’. The use of a car to access facilities was not an original area of investigation in the interview schedule, but established itself during FGDs as a reason why particular facilities (e.g. skate park) may or may not be used.

While the amount of physical activity young people engaged in did not appear to be affected by access to transport, it was notable that they were most likely to use a facility because it was close to where they lived. Having a single area where more than one activity could take place was described as the ideal facility. This may go some way towards explaining the popularity of greenspace use across the sample. Availability and use of greenspace was discussed by all SES groups, although more common as the main area for being active by those attending low SES schools, most likely due to proximity and possibly as ‘other’ facilities were not always nearby. Findings showed the majority of young people, particularly those attending lower SES schools, were most likely to be active in areas close to home or school. This was supported by maps and blogs which often reported use of local greenspace. Some from low SES suggested that travelling to facilities further away could be expensive, emphasizing the need to ensure that affordable public transport routes are available, as well as safe walking and cycling routes.

Previous findings have shown people in low-income households, most likely to adopt low levels of physical activity, are also likely to be the least well served by affordable facilities which would enable them to be active [39]. This was apparent among schools in areas of lower SES in the current study. This may, in part, have been due to school location. Both low SES schools and one medium SES school were located away from the city centre, whereas both high SES schools were located centrally. Thus, observed SES differences may in fact represent issues of opportunity and access. Perceived availability of sports facilities and parks has previously been associated with engaging in sports, as well as with walking and cycling in leisure time among urban adolescents [40]. Although all schools in this study were urban, in a recent Scottish study investigating the distribution of physical activity facilities by small area measures of deprivation and urbanicity, urban–rural status was found to explain associations between physical activity and health [21]. The association between area-level deprivation and density of physical

**Fig. 7.** Blog demonstrating the school environment as a place for physical activity (School C, S1 girl).
activity facilities altered after adjustment for urbanicity (entering indicator variables for urban–rural classification [37] into the statistical model) with middling SES areas having the highest density of facilities after adjustment, dependent on the city under observation. Furthermore, the notion of the ‘walkability’ and connectivity of communities within cities may also affect young people’s use of greenspace and sports facilities [41]. It is recommended that future research considers urbanicity and associated factors that may confound the relationship between deprivation and physical activity.

Cost and affordability of facilities was shown to be important across both genders and all levels of SES, but particularly lower SES. Young people were likely to pay to use an area if they thought it was good value for money. Many spoke of greenspace which they and their friends regularly used for social activities. In areas where there were fewer sports facilities, the relevance of local greenspace was more prominent. Interventions that capitalize on young people’s free use of greenspace should be explored. There is some evidence of an association between greenspace and obesity-related health indicators, but findings are inconsistent and mixed across studies [42]. A recent study in Scotland suggests that physical availability of urban greenspace interacts with community contexts already established (e.g. social cohesion) and that a more holistic understanding of access is needed [41]. This study suggests that while local greenspace is a popular area for physical activity, it is rarely mentioned without reference to physical (e.g. safety) and social (e.g. spending time with friends) factors. Such factors should be considered when promoting it as a resource for physical activity.

This study highlighted the important role of parents in encouraging their child’s physical activity, through being active with their child, verbal encouragement and financial support. This concurs with previous findings which showed parental support to be associated with increased physical activity during adolescence [43]. In this study, no SES differences were apparent in support or lack of support from parents. However, recent research has shown that parents’ decisions to enrol their child in sport is influenced by availability of a greater variety of locations, and this has been shown as particularly important among lower income families [44]. In this study, parents were often discussed in the context of the home. For example, FGDs brought to light the issue of parents restricting time spent using electronic equipment (e.g. computer games) and encouraging more active leisure pursuits. Previous research has shown factors influencing children’s electronic media use to include parent modelling and reinforcement, as well as household electronic media use rules and restrictions [45]. While parental physical activity was explored in this study, the issue of parent sedentariness as a source of social influence was not. Further investigation of this area, alongside influences on physical activity participation would be beneficial in understanding the role of parental behaviours and restrictions.

This study showed friends as an important influence on physical activity and could exert a negative or positive effect. High peer support and time spent with friends has previously been shown to increase the odds of being active [43], whereas low peer support can reduce the odds, particularly out of school [46]. This study showed that peers may discourage active behaviours by promoting more sedentary options. Previous qualitative findings have shown this to be the case among girls with regards to walking [31], and general physical activity [47]. However, current evidence of how peers may negatively influence physical activity participation is limited and warrants further investigation.

Schools in Scotland are currently recommended to provide at least 2 hours of PE per week for all pupils. In a recent sample of 53 Scottish secondary schools, only half (49%) delivered this in S1–S4 (age 12–16 years), and only one in eight for S5/S6 (age 16–18 years) [48]. This study highlights young people’s desire to adhere to the recommendations, and common across almost all schools was the notion that more PE time is needed. Many pupils reported 2 hours a week was not reached when changing and/or travelling time was taken into account. They welcomed the idea of extra PE lessons. Schools should consider the structure of PE lessons to maximize time spent being active. Recent
findings have shown that increased time in PE may increase overall moderate to vigorous physical activity among adolescent girls, confirming the importance of PE time in schools especially for low active groups [14]. The expressed desire to do more PE should be embraced by schools at a time where physical activity levels are typically low [33]. This study also highlighted girls’ desire to have a say in the type of physical activities available to them during PE, and sometimes reported how they would like to do the same activities as boys or at least be given the option. This concurs with recent findings which show that consulting girls and offering activities they feel comfortable with at school can result in improved attitudes and engagement in PE [49].

Pupils were generally satisfied with the availability of school sports facilities, despite not all schools having on-site facilities. Recent findings among adolescent girls in Scotland showed school sports facilities to have no significant impact on physical activity levels, but rather the provision of sports clubs and extra curricular activities is likely to have a stronger effect [14]. The fact that pupils in this study more commonly used photos of the ‘activity’ they took part in rather than the ‘place’, might further suggest that, in general, activity is more important than facilities to young people. A key aspect of creating an environment in which young people can be active may therefore lie in extra-curricular activities, enabling provision of organized physical activity outside school hours, even within areas where there may be a lack of local facilities.

The study findings are important at local level, but cannot be generalized across Scotland. Furthermore, young people were asked to opt-in to the FGDs and it is possible that those who took part were more likely to be physically active. Their views may not necessarily be representative of all young people their age. While the inclusion of friendship pairs in the FGDs provided a comfortable environment to enhance the richness of the data, the potential influence of such groupings should also be noted particularly in terms of limiting the breadth of responses. Different types of friendship groups can also affect both the initiation and maintenance of youth physical activity, with boys and girls relating differently to physical activity and social status [47]. A larger scale study involving qualitative and quantitative data may be beneficial. The study sought to use participant digital photography to represent local environment and physical activity behaviours. Despite the researcher explaining the task, and attending each computer session, only small numbers took photos, with fewer still able to incorporate them into their blog. Reasons included forgetting or being unable to take photos within the allotted time, forgetting to bring in necessary equipment and problems uploading photos. Pupils unable to take their own photos could use ‘Google’ images and were often able to select very specific photos (e.g. local leisure centre). This proved a successful method and may be applied in future studies. Further exploration into how this method can be used more effectively would be beneficial. A limitation may have been the timing of data collection, which took place in the autumn/winter. Adverse weather conditions resulted in several school closures and some sessions were cancelled or rescheduled; therefore, affecting the continuity of the study and school visits. One school was unable to reschedule the computer session and therefore this data was not collected from this school. Furthermore, cold weather may have resulted in participants taking fewer photos within their local environment or affecting the types of photos taken. It would be interesting to carry out this research at different time points as seasonality is known to affect physical activity [50].

While the focus of this study was not on gender differences, the inclusion of single-sex focus groups and a split of boys and girls across the sample allowed for some consideration of gender and socio-environmental influences on physical activity. Previous quantitative studies have identified differences in influences on physical activity among youth according to gender [51], including internal and external barriers and proximity to school. This study highlighted that many issues facing young people’s decisions to be physically active within their local environment apply across both genders. In
particular, the issue of ease of access was paramount. While the type of activity or facility could vary between boys and girls, the need for proximity and value for money applied regardless of gender. A larger qualitative study, including a wider age range of boys and girls and focussing purely on physical activity (this study also investigated eating and the food environment) would help expand knowledge of gender differences and the physical activity environment.

In conclusion, these findings provide a unique insight into young people’s use of their environment in relation to their physical activity. In line with socio-ecological theory, it is clear that individual behavioural choices are either facilitated or constrained by wider aspects of the social and physical environment. Participation in different types of activities was constrained by the availability of, and access to, appropriate facilities. For those from lower SES areas, where more restrained access to sports facilities was reported, this may have a particularly negative impact on young people’s ability to engage in a range of activities or opt-in to activities they particularly enjoy. Poor access and high cost were key barriers which may also disproportionately disadvantage those from less affluent areas. Findings highlighted the need for access to free opportunities for physical activity, reinforcing the importance of local greenspace as a resource. Findings may be used to help inform development of innovative interventions, aimed at promoting active living among the adolescent age group.

Acknowledgements

We would like to thank Professor Candace Currie OBE who assisted with the study development. We would also like to thank all the schools and their staff and pupils who took part in this study.

Funding

Scottish Government Chief Scientist Office (CSO) (CZG/2/480).

Conflict of interest statement

None declared.

References

Socio-environmental influences on young people’s physical activity

41. Seaman PJ, Jones R, Ellaway A. It’s not just about the park, it’s about integration too: why people choose to use or not use urban greenspaces. *Int J Behav Nutr Phy* 2010; 7: 78.