Park use patterns among children—dual roles of neighbourhood parks

Nor’Aini Yusof1, Abrar Abulzawaid2 and Samah M. El-khateeb1

1School of Housing, Building and Planning, Universiti Sains Malaysia, Malaysia
2Moataz Makki Engineering Consultancy, Jeddah, Kingdom of Saudi Arabia
3Faculty of Engineering, Ain Shams University, Egypt
*Email:ynoraini@usm.my

Abstract. The close link between neighbourhood parks and people’s physical and mental health is widely acknowledged. However, most neighbourhood parks were developed without consulting park users. As a result, many parks were deserted and not well utilised. While there is an increased interest in neighbourhood park research, little is known on the park use patterns among children. The main aim of this paper is to explore the park use patterns— or type of activities—that children perform at neighbourhood parks. Children in Alazizeyyah neighbourhood in Jeddah, Saudi Arabia were chosen as participants. The data were collected through children’s drawings and oral descriptions. The data were analysed using thematic analysis. The results showed that children engage more in active park use, in which swinging, family gathering and sliding are the top park use patterns among children in the study area. The results suggested the dual-roles of neighbourhood park—to promote physical and mental health among children and to encourage social ties among family members and friends. The results imply the importance of considering child-friendly environment in the development of neighbourhood parks to increase park visitation and use and subsequently, improve health and wellbeing.

1. Introduction
The close link between neighbourhood parks and people’s physical and mental health is widely acknowledged. Gong, Gallacher (1) and recently confirmed by Stewart, Moudon (2) supported that neighbourhood park encourages physical activities; such as walking and cycling. There is evidence to suggest that greenery at the neighbourhood park helps to reduce air pollution and create a healthier environment (3). If located near residential areas, neighbourhood park helps to promote physical activities, reduce obesity problems (4), and restore positive mood and self-perceived confidence among users (5). Increase use of neighbourhood park reduces stress and subsequently promotes mental health not only for adults (6) but also for children (7). Similarly, children who are exposed to neighbourhood parks are physically and emotionally healthier than children who are not (8). In addition, neighbourhood parks
offer venues for social events where people can meet and interact with others (9). Frequency of park visitations and certain park use activities such as sitting and picnicking are found to encourage social interaction (10). Notably, Chawla (11) called for children access to neighbourhood parks with green landscapes near their homes and schools, to ensure children’s health and social well-being. These studies substantiate the importance of neighbourhood park design and features that encourage visitation and utilisation for children’s well-being.

Despite the benefits of neighbourhood parks on children’s physical and mental health, many parks were empty and not well utilised. Studies in the USA found that children use of neighbourhood parks is generally low even with the presence of children facilities at the park (12, 13). Mismatch between the park facilities built by the city planners and facilities needed by the diverse park users is one of the reasons for low visitation and usage of neighbourhood parks (14). For example, outdoor fitness equipment was built to encourage active recreational activity; although fitness equipment benefits more matured users (15), accidents among children when using the equipment is high (16). This example confirms earlier studies by Castonguay and Jutras (17) and Loukaitou-Sideris and Sideris (13) that the reason for low park visitation among children is because the children tend to avoid parks that they perceived to have safety threats. Derr and Kovács (18) blamed city planners for being insensitive to the needs of children when planning and designing neighbourhood parks. Moreover, children were rarely engaged, and their views were not consulted in the city planning process (19, 20).

While there is an increased interest in neighbourhood park research, little is known on park use patterns among children (12). Most studies focused on the benefits of neighbourhood parks (5, 16), accessibility issues of neighbourhood parks (14, 21) and determinants of neighbourhood parks visitation (22, 23). A small number of studies on park use however, tend to focus on measuring the frequency of park use than the patterns of park use (21, 24). A neighbourhood park will only benefit its targeted users, both physically and socially, if it is visited frequently and well utilised (10). Subsequently, to attract children to visit and utilise neighbourhood park it is important to create child-friendly neighbourhood parks (25) by understanding the types of activities that they would like to do while at the park (26). Understanding park use patterns among users helps city planners to build parks with design, layouts and facilities that fulfil users’ needs and therefore, increase park visitation and utilisation (9, 27).

The above argument justifies the need for another study to shed our understanding on park use patterns among children. Therefore, the main aim of this paper is to explore the type of activities that children perform while at neighbourhood parks. Children residing in Alazizeyyah neighbourhood in Jeddah, Saudi Arabia were selected as the participants for the study. The reason to target children in this area is because it was reported in earlier studies that the neighbourhood park in Alazizeyyah neighbourhood experienced the highest number of visits amongst children in Jeddah (28, 29).

Theoretically, the results contribute to the ongoing debate of child-friendly environment insinuated by Lotta, Maria Giuseppina (30) in our cities. Likewise, the present study supports Timperio et al. (31) argument on the vital role that built environment can play in encouraging park visitation and use among children. Practically, understanding park use patterns among children can assist city planners and policy makers to identify the optimal neighbourhood park design and layout for active activities and social interaction that can increase visitation and park use and subsequently bring positive impacts to children’s well-being.

2. Children park use patterns/activities
As mentioned earlier, there is a dearth of studies that explore park use patterns among children in neighbourhood parks. Park use refers to activities that users performed or conducted while at the park (26, 27). In System for Observing Play and Recreation in Communities (SOPARC) introduced by McKenzie, Cohen (32), the observation tool identified three park use patterns – physical (walking), vigorous (football, basketball) and sedentary (sitting and lying down) activities. More recent studies categorised park use patterns into two – active and passive park users (14, 26, 33).

Active park use refers to physically active and mobile activities that users engage while at a park Willemse (14), page 3. Examples of active park use patterns are walking and jogging (33), playing sports and use of playground or exercise equipment (14), hide and seek and cycling (26), and participating in organised sports (soccer or basketball) (13). Reasons for engaging with active park use are to reduce weight, improve fitness, contact with nature and socialise (34) or because active park use is more fun (13). Additionally, active park use is found to improve moods and energy levels (5). In contrast with other studies, Van Hecke, Van Cauwenberg (26) found that more than half of the park users in Ghent, Belgium were engaging in active park use. Studies in Australia revealed that installation of play equipment provides greatest impact on children’s park use patterns in both short and long term, indicating a big change of activity level from moderate to vigorous (34, 35). These studies supported an earlier study by Floyd, Spengler (36) which found that children in 28 parks in Florida, and Illinois, USA were prone to engage with vigorous park use. Studies consensually agreed that children usually engage with active park use more than other park users (13) and active park use is an effective weapon to combat obesity, cardiovascular disease and depression among children (16, 26, 34). Nevertheless, more often than not, organised sports aimed at encouraging active park use received low participation from children (13).

On the other hand, passive park use refers to stationary, investigative and inquisitive activities when using the park Willemse (14) page 3. Examples of passive park use are standing in place, observing, sitting, family picnics, hanging out with friends, lying down on grass and sleeping (13, 31, 33, 35). Non-Caucasians are inclined to engage with passive park use as compared to Caucasians (26) and girls have more tendency to engage in passive park use as compared to boys (13). According to Loukaitou-Sideris and Sideris (13) girls prefer to use playground but they were less satisfied with neighbourhood park facilities as most of their playground facilities were built to cater smaller children, pushing girls to passive park use more than active park use. Generally, passive activities if performed elsewhere such as at home give negative impact to the children (4, 8, 31). But passive park use like sitting, observing, lying down on grass and hanging around with friends encourage social interactions and improve mental health (7, 9, 10). Correspondingly, neighbourhood park has a role in fostering social ties among friends and family members – in Australia it was found that visiting parks with friends, family adults and siblings ranked highest than with organised groups or individually (35). Also, other passive activities such as relaxing and contacting with nature improve mental health (5).

Therefore, the present study attempted to explore park use pattern among children in hopes of assisting city planners and policy makers on what to prioritise when designing neighbourhood parks in order to increase visitation and utilisation, and subsequently bring positive impacts to children’s well-being. Next, we turn to our empirical study.

3. Methodology
Acknowledging the challenge of gathering information from children, the present study utilised children drawings to explore park use patterns among children. According to Bland (37) children face difficulty to communicate their experience and feelings into words. Therefore, children drawing acts as a mean to communicate their experience when visiting neighbourhood parks. As opined by O’Brien (38), children
experience is important to guide improvement efforts to existing neighbourhood parks. Alazizeyyah neighbourhood in Jeddah, Saudi Arabia was chosen as a case study. A drawing session was organised at Alazizeyyah community centre with approval from the centre’s director. Invitations were sent to all residents of the neighbourhood, inviting their children between the age of 5 to 11 years to participate in the drawing session. 40 residents agreed to bring their children to the drawing session but only 35 children turned up with their mothers or close family members. The children were asked to draw activities that they do while at the neighbourhood park. Stationeries such as A4 papers, crayons, markers, glitter, and colour pencils were provided to participants.

Apart from the drawings, the children were asked to explain their drawings while researchers took notes to document the explanation; adhering to Bland’s (37) advise to include participant’s oral description when interpreting drawings. This explanation session aims to clarify the meaning of the drawings, verify ambiguous sketches and subsequently, ensure validity of the interpretations made to the drawings. The explanation session is done informally to create a conducive environment for children to talk freely about their drawings without being under pressure to express their views. For younger children, the explanation was done with the presence of their parents or closed family members because they were susceptible about the researchers’ presence. The drawing and oral description sessions last for 4 hours with 29 drawings submitted to the researchers.

4. Results

The data were analysed using thematic analysis. A qualitative data analysis software (QDAS); Atlas.ti version 8 was used to analyse the children drawings and notes of the children’s oral description. A unique code was assigned to each element in the drawings. The children’s oral descriptions were used to link the codes, create code groups and a network. Eleven activities emerged; where six activities are active park use while five activities are passive park use. The results were transported into an Excel file, depicted in Table 1: Park use pattern among children in Alazizeyyah neighbourhood.

In Table 1, it is shown that children in Alazizeyyah neighbourhood engaged in more active park use pattern with 24 pictorial contents, than passive park use (19 pictorial contents). The top 3 most common activities that the children do when they are at the neighbourhood parks are swinging (12 pictorial contents), family gathering (7 pictorial contents) and sliding (6 pictorial contents).

| Type of activity     | Number of pictorial contents | Where?               | Park use pattern | Additional Comments        |
|----------------------|------------------------------|----------------------|------------------|----------------------------|
| 1 Climbing           | 1                            | Climbing bars        | Active           |                            |
| 2 Use fitness equipment | 2               | Outdoor fitness equipment | Active           |                            |
| 3 Jogging and walking | 2                            | Jogging path         | Active           |                            |
| 4 Use Play area      | 1                            | playing area         | Active           | Make friends Sociability   |
| 5 Sliding            | 6                            | Slides               | Active           | Make friends Sociability   |
| 6 Swinging           | 12                           | Swings               | Active           | Make friends Sociability   |

Total active park use 24
Active park use was dominated by swinging and followed by sliding. Apart from being physically active when engaging in swinging and sliding, children relayed that they had the chance to meet others and make new friends. Similarly, children had the chance to meet others and make new friends when using playing area for running, jumping and skipping. Additionally, children also engaged in jogging and walking, use of outdoor fitness equipment and climbing. Both boys and girls are involved in active park use. Girls’ activities are confined to swinging, sliding and using play area while boys have more diverse active activities ranging from climbing, using fitness equipment, jogging and walking to the slide and swinging. Figure 1 shows the active park use pattern of children in Alazizeyyah neighbourhood.

Passive park use was dominated by family gathering activity with seven pictorial contents, followed by meeting friends (4 pictorial contents) and sitting, hanging around and picnicking (3 pictorial contents each). Majority of passive park use activities involving girls and boys only took place in family gathering. In family gathering activity, the children recounted meeting other relatives like grandmothers and grandfathers, aunts, uncles and cousins. One ten-year-old girl told that her big family would usually go to a park that offers private picnic area for family gathering once a month and they will spend the whole evening at the park. The children also used parks to hang out with friends, where parks with gazebo offer...
shaded and a nice area for such activity. In addition, neighbourhood parks were used for sitting activity either on the bench or on the ground. According to an eleven-year-old girl, the cleanliness of the ground and how comfortable the bench is will determine whether she will spend her time sitting in a park. Figure 2 shows the passive park use pattern of children in Alazizeyyah neighbourhood.

![Diagram of park use patterns](image)

**Figure 2.** Passive park use pattern of children in Alazizeyyah neighbourhood.

5. **Discussion**

Figure 1 and Figure 2 provide the models of park use patterns that the children engaged in at neighbourhood parks. Six activities: swinging, sliding, jogging, walking, use of fitness equipment, use of play area and climbing, are identified as active park use patterns. Meanwhile, family gathering, meeting friends, picnicking, hanging around and sitting are the five passive park use activities that the children of Alazizeyyah neighbourhood engaged in at neighbourhood parks.

This study revealed that generally, children in Alazizeyyah neighbourhood were engaged in more active park use than the passive park use, in which girls are inclined to engage in passive park use, reinforcing Loukaitou-Sideris and Sideris (13) work on park visitation patterns among children and gender. Specifically, the results are analogous to Evenson et al. (33) and Willemse (14) studies on jogging and walking activities and the use of exercise equipment when they are at parks. Also, the results are similar to Timperio et al. (31) and Evenson et al. (33) on sitting, picnicking and hanging out with friends’ activities when they are at the neighbourhood parks. Notably, the present study reveals high account of family gathering activity at neighbourhood parks expressed by children of Alazizeyyah neighbourhood. The results are similar to Veitch, Salmon (35) study that emphasised neighbourhood park’s role to foster social ties among family members apart from offering venue for active physical activities. Therefore, it can be deduced that firstly, there are similarities in park use patterns across age and gender in Jeddah and elsewhere, despite the differences that may exist due to location and culture,
signalling the cross-cultural relevance of park use patterns among children. Secondly, the results establish another role of neighbourhood parks as a means to foster ties among family, friends and neighbours apart from its widely accepted role of improving physical and mental health.

On the contrary, engaging with cycling and organised sports activities are not reported by the children of Alaziziyah neighbourhood. One possible reason is that cycling activity is usually prohibited at neighbourhood parks (35). Also organised sports at neighbourhood parks is not yet a custom in Saudi Arabia despite the government encouraging Saudi people to embrace a healthier lifestyle through increased physical activity (39).

6. Conclusion
The results provide a greater understanding of the park use patterns among children embodied in their drawings and oral descriptions. By requesting children to draw the activities that they do when visiting neighbourhood parks, the study has obtained rich information of children assessments based on their experiences while at a park. Thus, by identifying park use patterns among children, the study refine what Lotta, Maria Giuseppina (30) meant as child-friendly environment and reinforce the importance of built environment to increase park visitation and use among children put forward by Timperio et al. (31). The results reveal that there are dual roles of neighbourhood parks – as a means of improving health and fostering social ties. Children engaged more in active park use than passive park use, with the top 3 most common activities being swinging, followed by family gathering and sliding. Therefore, future neighbourhood park designs should put emphasis on encouraging swinging, family gathering and sliding activities. Swings and slides should be made available to cater children of all ages. At the same time, privacy, cleanliness and comfort should be considered when providing a gathering space for family and friends.

The study is unique in the use of children’s drawings and oral description and purport that these techniques provide effective means of gathering information from children to improve park visitation and use among the targeted group. However, it is important to acknowledge several limitations of the study. First, the study is restricted to children in one neighbourhood in Jeddah. Therefore, extra caution should be made before generalising the results to other areas. A larger study that covers the whole Kingdom of Saudi Arabia could offer valuable information to policy makers for neighbourhood parks’ improvement. Second, the study only involved children where views from other parks users are not sought. Involving all neighbourhood park users will add more value to our understanding of park use patterns for future improvement of neighbourhood parks.

References

[1] Gong Y, Gallacher J, Palmer S, Fone D. Neighbourhood green space, physical function and participation in physical activities among elderly men: the Caerphilly Prospective study. International Journal of Behavioral Nutrition and Physical Activity. 2014;11(1):40.
[2] Stewart OT, Moudon AV, Littman AJ, Seto E, Saelens BE. Why neighborhood park proximity is not associated with total physical activity. Health Place. 2018;52:163-9.
[3] Markevych I, Schoierer J, Hartig T, Chudnovsky A, Hystad P, Dzhambov AM, et al. Exploring pathways linking greenspace to health: theoretical and methodological guidance. Environmental Research. 2017;158:301-17.
[4] Sallis JF, Cerin E, Conway TL, Adams MA, Frank LD, Pratt M, et al. Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study. The Lancet. 2016;387(10034):2207-17.
[5] Liu H, Li F. The relationships between urban parks, residents' physical activity, and mental health benefits: A case study from Beijing, China. Journal of Environmental Management. 2017;190:223-30.

[6] Hong A, Sallis JF, King AC, Conway TL, Saelens B, Cain KL, et al. Linking green space to neighborhood social capital in older adults: The role of perceived safety. Social Science and Medicine. 2018;207:38-45.

[7] Shi Y. Explore Children's Outdoor Play Spaces of Community Areas in High-density Cities in China: Wuhan as an Example. Procedia engineering. 2017;198:654-82.

[8] Ward JS, Duncan JS, Jarden A, Stewart T. The impact of children's exposure to greenspace on physical activity, cognitive development, emotional wellbeing, and ability to appraise risk. Health Place. 2016;40:44-50.

[9] Plane J, Klodawsky F. Neighbourhood amenities and health: Examining the significance of a local park. Social Science and Medicine. 2013;99:1-8.

[10] Mowen AJ, Rung AL. Park-based social capital: are there variations across visitors with different socio-demographic characteristics and behaviours? Leisure/ Loisir. 2016;40(3):297-324.

[11] Chawla L. Benefits of Nature Contact for Children. Journal of Planning Literature. 2015;30(4):433-52.

[12] Dunton GF, Almanza E, Jerrett M, Wolch J, Pentz MA. Neighborhood park use by children: use of accelerometry and global positioning systems. American journal of preventive medicine. 2014;46(2):136-42.

[13] Loukaitou-Sideris A, Sideris A. What brings children to the park? Analysis and measurement of the variables affecting children's use of parks. Journal of the American Planning Association. 2010;76(1):89-107.

[14] Willemsen L. A class-differentiated analysis of park use in Cape Town, South Africa. GeoJournal. 2017:1-20.

[15] Sami M, Smith M, Ogunseitan OA. Changes in Physical Activity After Installation of a Fitness Zone in a Community Park. Preventing chronic disease. 2018;15:E101-E.

[16] Chow H-W, Wu D-R. Outdoor Fitness Equipment Usage Behaviors in Natural Settings. International journal of environmental research and public health. 2019;16(3):391.

[17] Castonguay G, Jutras S. Children's appreciation of outdoor places in a poor neighborhood. Journal of Environmental Psychology. 2009;29(1):101-9.

[18] Derr V, Kovács IG. How participatory processes impact children and contribute to planning: a case study of neighborhood design from Boulder, Colorado, USA. Journal of Urbanism: International Research on Placemaking and Urban Sustainability. 2017;10(1):29-48.

[19] van Vliet W, Chawla L, Derr V. Children as natural change agents: Child friendly cities as resilient cities. Designing Cities with Children and Young People: Routledge; 2017. p. 24-35.

[20] Carroll P, Witten K, Asiasiga L, Lin E-Y. Children's Engagement as Urban Researchers and Consultants in Aotearoa/New Zealand: Can it Increase Children's Effective Participation in Urban Planning? Children & Society. 2019;0(0).

[21] Derose KP, Han B, Williamson S, Cohen DA. Gender Disparities in Park Use and Physical Activity among Residents of High-Poverty Neighborhoods in Los Angeles. Women's Health Issues. 2018;28(1):6-13.

[22] Zhang S, Zhou W. Recreational visits to urban parks and factors affecting park visits: Evidence from geotagged social media data. Landscape and Urban Planning. 2018;180:27-35.

[23] Paul S, Nagendra H. Factors influencing perceptions and use of urban nature: Surveys of park visitors in Delhi. Land. 2017;6(2).

[24] Chen Y, Liu X, Gao W, Wang RY, Li Y, Tu W. Emerging social media data on measuring urban park use. Urban Forestry & Urban Greening. 2018;31:130-41.
[25] King P, Sills-Jones P. Children’s use of public spaces and the role of the adult—a comparison of play ranging in the UK, and the leikkipuisto (Play Parks) in Finland. Int J Play. 2018;7(1):27-40.
[26] Van Hecke L, Van Cauwenberg J, Clarys P, Van Dyck D, Veitch J, Deforche B. Active Use of Parks in Flanders (Belgium): An Exploratory Observational Study. International Journal of Environmental Research and Public Health. 2017;14(1):35.
[27] Malek NA, Nashar A. Use pattern and activities: The evaluation of Malaysian green open space design. PlannMalays. 2018;16(3):121-31.
[28] Abuzeid R. Rethinking public space in the city of Jeddah, Saudi Arabia: Massachusetts Institute of Technology; 2012.
[29] Addas A. Motivation and Attachment in the Use of Public Open Spaces in Jeddah, Saudi Arabia: The University Of Sheffield; 2015.
[30] Lotta H, Maria Giuseppina P, Liisa H, Miretta P. Interpretations of Urban Child-Friendliness: A Comparative Study of Two Neighborhoods in Helsinki and Rome. Children, Youth and Environments. 2007;17(4):319-51.
[31] Timperio A, Crawford D, Ball K, Salmon J. Typologies of neighbourhood environments and children's physical activity, sedentary time and television viewing. Health Place. 2017;43:121-7.
[32] McKenzie TL, Cohen DA, Sehgal A, Williamson S, Golinelli D. System for Observing Play and Recreation in Communities (SOPARC): Reliability and Feasibility Measures. J Phys Act Health. 2006;3 Suppl 1:S208-s22.
[33] Evenson KR, Jones SA, Holliday KM, Cohen DA, McKenzie TL. Park characteristics, use, and physical activity: A review of studies using SOPARC (System for Observing Play and Recreation in Communities). Preventive Medicine. 2016;86:153-66.
[34] Cranney L, Phongsavan P, Kariuki M, Stride V, Scott A, Hua M, et al. Impact of an outdoor gym on park users’ physical activity: A natural experiment. Health & Place. 2016;37:26-34.
[35] Veitch J, Salmon J, Deforche B, Ghekiere A, Van Cauwenberg J, Bangay S, et al. Park attributes that encourage park visitation among adolescents: A conjoint analysis. Landscape and Urban Planning. 2017;161:52-8.
[36] Floyd M, Spengler JO, Maddock J, Gobster P, Suau L. Environmental and social correlates of physical activity in neighborhood parks: An observational study in Tampa and Chicago. Leisure Sciences. 2008;30(4):360-75.
[37] Bland D. Using drawing in research with children: lessons from practice. International Journal of Research & Method in Education. 2018;41(3):342-52.
[38] O’Brien M. Regenerating children’s neighbourhoods: What do children want? Children in the City: Routledge; 2003. p. 160-79.
[39] Addas A, Rishbeth C. The transnational Gulf City: Saudi and migrant values of public open spaces in Jeddah. Landscape Research. 2018;43(7):939-51.