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The Relationship of Children Connectivity and Physical Activities with Satisfaction of Open Spaces in High Rise Apartments in Tehran

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Abstract

Increase of urbanization has pressure on the urban children's lives and physical activities. While in designing of residential apartments' open spaces, there is little attention to the children. The children, who live in the high-rise apartments found to have less physical activities. However, supposedly, children need to engage in the physical activity in the outdoor areas as WHO recommend that children take part in at least one hour of moderate physical activity in every day. This paper firstly, reviews different researches in this area. Then, it attempts to find children's satisfaction regarding connectivity to open spaces as a dependent variable and their preferred activities, perceived safety, and familiarity about connectivity to open spaces as independent variables. The method of study is a semi-interview survey with 80 children between 6 and 12 years old (primary school ages) in two cases in Tehran. The result of this research shows that children satisfaction from open space has an effect on their outdoor activities. Therefore, the designers should be considering children physical activities needs in open spaces.

Keywords: Children, Satisfaction, Physical Activities, Open Space, Residential High-Rise Apartments

1. Introduction

Children's Physical activity is a fundamental part of development, which helps them to get their full potential (Barbel, 2000). It is a main aspect that effects on children's activities in open spaces. Physical activity in children has different nature in comparison with adults, especially children in age between 2 till 11 need for more physical activities than teenagers and adults; and almost all young people are naturally present higher physical activity levels than adult (Rowlands, Eston, & Ingledew, 1999). Almost all young people are naturally active and present higher physical activity levels than adults (Rowlands et al., 1999). This suggests children have an innate biological necessity of being active in normal growth and development (Bailey et al., 1995). Studies were also demonstrated that children do not remain inactive for extended periods of time, because of 95% of their time rest periods are shorter than 4 minutes 15 seconds (Gallahue, Ozmun, & Goodway, 2011). Therefore, the tendency for children to perform short, sprint type exercise of 5 to 10 seconds is understood (Brooks, Fahey, White, & Baldwin, 2000). Furthermore, there is a high association between the amount of time children spend outside of their home and higher level of physical activities(Sallis & Glanz, 2006).

Current guidelines recommend that children participate in at least 60 min of moderate physical activity on most days of the week(USDHHS, 2000; WHO, 2005). These findings have led to recommendations for designing tools that accurately detect trends of physical activity behavior in children (Welk, 1999)

Numerious researchers such as Valentine and McKendrick (1997), Chatterjee (2006) and Santer, Griffiths, and Goodall (2007) mentioned to relationship between children development and satisfaction from environment. On her other hand, Gifford (2007) stated that high-rises are less satisfactory than other forms of housing for most people and small children. Gifford also mentioned high-rises apartments are not good for children because parents keep them at home

(Gifford, 2007), even if facilities of open spaces cover much of children's needs (Huitt, 2007; Maslow, Frager, & Fadiman, 1970). Therefore, there is a probability that issues about urban children physical activities in are related to satisfaction from open spaces. Furthermore, primary children's needs are physiological needs and when they feel open space is safe and they can play there with friends, they will be satisfied (Driskell, 2002; UNESCO, 1988; WHO, 2004).

Those limitations reduced the available places for children to play at. While, the children that live in a cul-de-sac are more likely to play independently and unsupervised by parents because their stated that it is a safe place for their children to play (Veitch, Salmon, & Ball, 2008). Furthermore, Carver, Timperio, and Crawford (2008) and Weir, Etelson, and Brand (2006)suggests that low levels of children's physical activity in their neighborhood are associated with perceived of safety and their satisfaction about open space.

Theoretically, this study concentrates on Maslow's hierarchy of need theory. This theory is more relate to residents' satisfaction concerning their home areas (Maslow et al., 1970). In addition, literature reviewed the studies which are followed this theory in field of open space in apartments' environments. Maslow's theory provides several layers of motivational influences because human motivation is driven by a set of needs. These needs are arranged in a fundamental hierarchy. When the basic needs are satisfied, the individual begins to satisfy higher needs (Gordon, 2009). This theory is studied in many areas, for instance, Yang (2012) applied it in principles on street design as: familiar, legible, accessible, comfortable and safe and explains how these effect on people's satisfaction to use and enjoy their local neighborhoods. Mnisi-Mudunungu (2011) used it for study the satisfaction regarding safety and shelter as a need in home's environments for residents. Maruthaveeran (2010) exerted this theory in study about satisfaction regarding park spaces.

Therefore, this paper attempts to examine Maslow's theory regarding children's satisfaction and consequently their physical activities in the open space of high-rise apartments. The variables for this construct perceived safety, familiarity with open spaces. In this field, their satisfaction from open spaces in high-rise apartments about soft landscapes, children's playgrounds, recreation spaces and social spaces are discussed.

The aim of this study is to investigate the children's connectivity and physical activities in high-rise apartments. The objective of this research is to identify the children's satisfaction concerning high-rise apartments open space. Moreover, the research for answer follow questions, was designed a semi-interview to gathering data of children.

1- What are the children's satisfactions about high-rise apartments open space?
2- What are the children's prefer activities in the open space of high-rise apartments?
3- How children have perceived safety in the open space of high-rise apartments?
4- How children's familiarities effect on their connectivity to open space?

2. Method

Method of site selection and instruments that are applied for survey is explaining as follow.

2.1 Sample Selection

Two cases in North and West zone of Tehran are randomly selected, which aimed to represent a population.

A) Pas residential high-rise apartment chose from West of Tehran. It has 18 blocks with 16 floors with about 2100 residents that widespread in almost 52000 square meters areas (Figure 1). It has three small children's playground, green spaces and sitting benches spread throughout the site. The facilities in Pas open space are old, but enough for residents. Pas complex site has a flat surface for play field such as volleyball for adults and children and also has enough space for adults to sit there and accompany their children. Some bodybuilding instruments were installed with management that sometimes children use them.

Figure 1. Site of Pas High Rise Apartments

B) Sobhan was chosen in the North zone of Tehran. This condominium has twelve with 15 floors with about 3600 residents. It widespread in almost 78000 square meters areas (Figure 2). This complex like Pas has three small children's playground, green spaces and sitting benches. There are not special spaces for parents to sit there for interaction with others and accompany their children. In addition, there are some bodybuilding instruments installed in overall of the site that sometimes children use them too.

Figure 2. Site of Pas High Rise Apartments

2.2 Survey Instruments

This research focuses on children who live in the selected cases. The data collected by interview from children regarding their satisfaction and preferred activities, perceived safety, their familiarity with open spaces. In the survey interviews with children, they asked about their physical preferences regarding the open space and facilities showed in the pictures with booklet. Altogether, 47 children from Sobhan apartments and 33 children from Pas apartments interviewed. After gathering data from 80 children used the Statistical Package for Social Science (SPSS) Windows package version 20 for process of analyzing data and interpretation.

3. Results and Discussion

The satisfaction on open space is dependent variable and three independent variables are preferred activities, perceived safety and familiarity with open space, which the results of them explained as follows.

3.1 Satisfaction

Regarding satisfaction, one close-ended and three open-ended questions asked. In the close-ended question, the children asked whether they were satisfied with their condominium open area using categorical answer of Yes or No that 66 children (82.50%) stated that they were satisfied with their apartment open spaces, 14 children (17.50%) said that they were not satisfied with them. To understand why children were satisfied, they state what they liked about the open space that the results are categorized into five themes as shown in Table 1.

Table 1. Things That Children Like in Their Apartments' Open Space

Theme		Sub-theme	Total Items	Percent of 80 children
1	Soft landscaping	Trees, flowers, lawn, largeness, good and beautiful space, closeness to home, accessibility	63	78.8%
2	Playground	Playing, kinds of play, playing facilities	59	73.8%
3	Safety	Safe spaces, good security, privacy, calmness	22	27.5%
4	Social	Having more friends, finding friends	19	23.8%
5	Others	Weather, diversity, sitting area, lightness	14	17.5%
		Total	175	-

The results of Table 2 revealed most children liked soft landscape components (N = 63, 78.8%) together with their playground (N = 59, 73.8%). Meanwhile, only 27.5% (N = 22) of them referred to safety and 23.8% (N = 19) mentioned social spaces. It was found that diversity of soft landscape components in open spaces such as trees, flowers, lawn are more interesting for children than playgrounds, recreational and social spaces. To understand further why some children do not like their open space, asked them about what they do not like with regard to their high-rise open spaces. The data are analyzed and categorized into 6 themes (Table 2).

Table 2. Things That Children Do Not Like in Their Apartments Open Space

Theme		Sub-theme	Total Items	Percent of 80 children
1	Playground	Less facilities, small toys, broken toys,	19	23.8%
2	Safety	Less safety, unclean open space and playground,	18	22.50%
3	Social spaces	Management or neighbors prohibition to play	13	16.3%
4	Soft landscapes	Less green elements and sitting areas, having more steps	12	15.0%
5	Cars	Cars, car parks, car noises	10	12.5%
6	Others	Less playing time, pets, people noises	5	-
		Total	77	-

The results of the Table 2 revealed children do not like playground facilities due to less equipment, old or broken tools such as swing or slide (N = 19, 23.8%). Also, it is found that children comment about safety in their high-rise open spaces (N = 18, 22.5%). It is remarkable that they do not like some neighbors and apartments' management (N = 13, 16.3%) because, as children stated, they do not allow them to play in open spaces. Likewise, they do not like open spaces due to lack of soft landscapes (N = 12, 15.0%), and 12.5% (N = 10) of them do not like the presence of cars in open space. The results of above items demonstrate that children's satisfaction regarding open space are high, and they like soft landscape components and playgrounds more than social spaces. Furthermore, they are most dissatisfied with insufficient facilities and broken outdoor toys, management and neighbors' discipline.

3.2 Children Preferred Activities

Children also asked to state activities that they like to do in open space. They mentioned many activities that grouped into three categories (see Table 3). The results of the Table 4 show that all children love to play free games such as hide and seek, role-playing games as police, mothers and doctors, running, talking with friends, playing snowball fights and making snowman (N = 119, 63.3%), followed by playing with play tools such as swing and slide or their bicycles and skates in playground (29.8%). Only 6.9% of them like to play in playfield.

Table 3. The Plays That Children Like to Do in Open Space

Theme		Sub-theme	Total Frequency	Percent
1	Free Games	Hide and seek, running, be frozen, playing and making snowman	119	63.3
2	Tools Games	Role-playing games as mothers and doctors, talking with friends playing with playground toys, Biking, Skating	56	29.8
3	Field Games	Ping Pong, Badminton, Basketball and Soccer	13	6.9
Total			188	100%

To validate the findings, 12 scenes of open space activities shown to children and they asked to tick if they like the activities in this scene or not. All scenes of activities categorized in three groups as follows: 1- Tool games (TG), 2- Free games (FrG) and 3- Field games (FiG) (see Table 4 and Figure 3).

Table 4. Children Preferred Activities

Groups	Number of Scenes	Codes of Scenes
Tool Games	6	TG1, TG2, TG3, TG4, TG5, TG6
Free Games	3	FrG1, FrG2, FrG3
Field Games	3	FiG1, FiG2, FiG3
Overall	12	

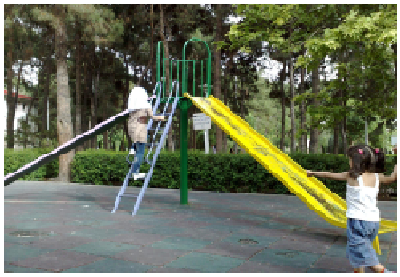
It is interesting to note that children preferences for every group of activities are almost similar. As shown in scene FrG2, 97.5% of children prefer snow playing (N = 78). Nevertheless, snow playing is limited to a certain time of the year. Furthermore, while 46.3% of children prefer group playing in scene FiG3 (N = 37), 51.3% of them do not like it (N = 41). According to the above results, children like to play everywhere, every time and with every tool or things. However, precisely speaking, their level of preferences regarding each scene is different.

3.3. Perceived Safety

The perceived safety of open space is one of the independent variables; therefore, children asked one open-ended and eight close-ended questions about open space safety. The results of analysis discussed below. Children with open-ended question asked about what they are afraid of in open spaces. They mentioned numerous things categorized into six themes observed in Table 5.

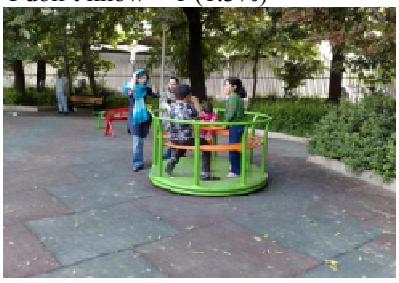
Scene TG1
Yes = 61 (76.3%)
No = 19 (23.8%)
I don't know = 0 (0.00%)

Scene TG2
Yes = 59 (73.8%)
No = 20 (25.0%)
I don't know = 1 (1.3%)

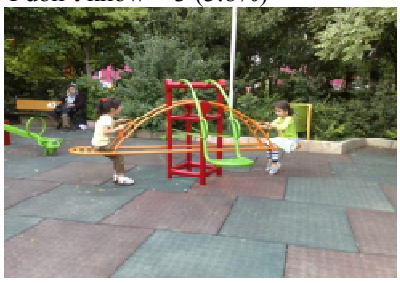


Scene TG3
Yes = 44 (55.0%)
No = 33 (41.3%)
I don't know = 3 (3.8%)

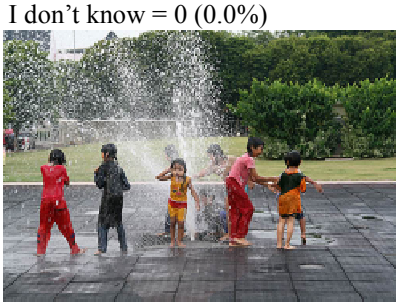
Scene TG4
Yes = 58 (72.5%)
No = 22 (27.5%)
I don't know = 0 (0.0%)



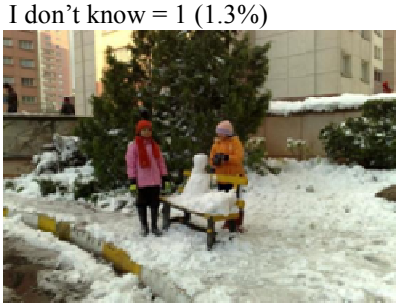
Scene TG5
Yes = 49 (61.3%)
No = 30 (37.5%)
I don't know = 1 (1.3%)



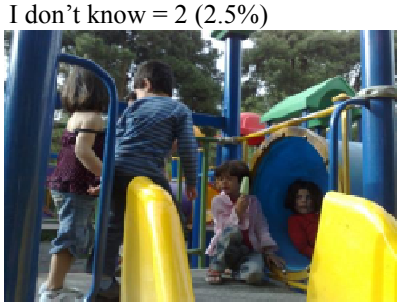
Scene TG6
Yes = 49 (61.3%)
No = 29 (36.3%)
I don't know = 2 (2.5%)



Scene FrG1
Yes = 56 (70.0%)
No = 22 (27.5%)
I don't know = 2 (2.5%)



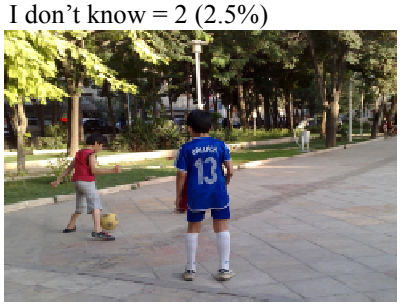
Scene FrG2
Yes = 78 (97.5%)
No = 2 (2.5%)
I don't know = 0 (0%)



Scene FrG1
Yes = 56 (70.0%)
No = 22 (27.5%)
I don't know = 2 (2.5%)

Scene FrG2
Yes = 78 (97.5%)
No = 2 (2.5%)
I don't know = 0 (0%)

Scene Fr3
Yes = 43 (53.8%)
No = 34 (42.5%)
I don't know = 3 (3.8%)



Scene FiG1
Yes = 56 (70.0%)
No = 23 (28.8%)
I don't know = 1 (1.3%)

Figure 3: Scenes of Activities in Open Spaces Around Sobhan and Pas (Photos Source : Ali Sharghi)

Table 5. Something Children Are Afraid of in Open Space

Theme	Sub-theme	Total Frequency	Percent
1 Nothing	Never to be afraid	37	42.6
2 Stranger	Adults, kidnappers,	13	14.9
3 Darkness	-	9	10.4
4 Cars	Accidents, car noises	7	8.0
5 Injury	-	4	4.6
6 Others	Pets, solitude, ghost, insect, steps	17	19.5
Total		87	100

Result from Table 5 reveals that 42.5% of children (N = 37) are not afraid of anything in open space. However, 37.9% (N = 33) stated that they are afraid of strangers (adults and kidnappers), darkness, cars and injury, and the remaining 19.6% (N = 17) mentioned other items. It found that children have fears in relation to other adults and strange and unknown conditions in open spaces. Meanwhile, no fear with regard to soft landscapes, children's areas, social and recreational spaces and other children mentioned.

In the close-ended questions, they asked about their sense of safety and preferences for open space as well as factors showing lack of safety, e.g. crowdedness, dirtiness, darkness, probable injury and car accident in open space. For these items, children's answers in categories of Yes and No were descriptively analyzed (see Table 6**).**

Table 6. Descriptive Analyses of Children Perceived Safety

Items		Yes	No	I don't know
		Percent and Frequency		
1	Do you feel safe in your apartment open space?	78.8% (N = 63)	21.2% (N = 17)	0.0% (N = 0)
2	Do you like your apartment open space?	88.8% (N = 71)	7.5% (N = 6)	3.7% (N = 3)
3	Is your open space crowded?	33.8% (N = 27)	66.2% (N = 53)	0.0% (N = 0)
4	Can see home windows from open space?	45.0% (N = 36)	55.0% (N = 44)	0.0% (N = 0)
5	Are you afraid of darkness in open space?	22.5% (N = 18)	77.5% (N = 62)	0.0% (N = 0)
6	Is your open space dirty?	30.0% (N = 24)	70.0% (N = 56)	0.0% (N = 0)
7	Are you afraid of being injured in open space?	17.5% (N = 14)	82.5% (N = 66)	0.0% (N = 0)
8	Are you afraid of car accident in open space?	36.3% (N = 29)	63.7% (N = 51)	0.0% (N = 0)

Descriptive results of Table 6 show that 78.8% of children (N = 63) feel their open space is safe, and only 21.2% (N = 17) do not feel so. Furthermore, 88.8% of children (N = 71) like their open space, and only 7.5% (N = 6) do not like it. Additionally, 66.2% of children (N = 53) stated that their open spaces is not crowded and 70.0% of them (N = 56) believed that their open spaces is not dirty, but 55.0% of them (N = 44) mentioned that they cannot see their home windows when they are in open space. Furthermore, 77.5% of children (N = 62) were not afraid of darkness in open space, 82.5% of them (N = 66) were not afraid of being injured in open space and 63.7% of them (N = 51) were not afraid of car accident in open space. These items analyzed one by one in the following sections.

3.3.1. Relationship between Satisfaction Factors and Safety

To test whether there is a relation between children's satisfaction and the perceived safety, X^2 tests performed for each perceived safety variable as follows.

1. Satisfactions and Safety in Open space

Results of Table 6 show while 78.8% of children (N = 63) feel their apartment open spaces are safe, 21.2% of them do not feel so. Furthermore, Table 7 demonstrates a significant relationship between the two groups of children and satisfaction from open space. Accordingly, the Chi-square test was performed and a relationship was found between category groups at $X^2_{4.73}$; P = 0.040. This implies that the children who (87.3%, N = 55) feel open space is safe are more satisfied with open space than those (64.7%, N = 11) who do not feel so (Table 7). It revealed when children feel safe in open space, their satisfaction level rises. Thus, feeling safety has a positive effect on satisfaction.

Table 7. Relationship Between Feeling Safe in Open Space and Satisfaction

Item			Satisfaction from open space NO	Satisfaction from open space YES	Total	Chi-Square P-Value
To feel safe in open space	NO	Count	6	11	17	
		% within to feel safe in open space	35.3	64.7	100.0	$X^2 = 4.73$
	YES	Count	8	55	63	P = 0.040
		% within to feel safe in open space	12.7	87.3	100.0	
Total		Count	14	66	80	
		% within to feel safe in open space	17.5	82.5	100.0	

2. Satisfactions for Preferred Things in Open space

As the results of Table 6 show, 88.8% of the children (N = 71) in both cases like their open spaces. Only 7.5% (N = 6) do not like open spaces overall and 3.7% (N = 3) made no reply to this item. According to the result of the X^2 test, there is no significant relationship between category groups at $X^2_{1.76}$; P = 0.185.

3. Relationship between Satisfaction and Crowdedness

Based on the results in Table 8, when children were asked about their open space crowdedness; 66.2% of them (N = 53) answered No and 33.8% (N = 27) stated that their open spaces are crowded. The Chi-square test was performed and a significant relationship was found between the two groups of children at $X^2_{10.78}$; P = 0.002. The Table 8 shows the relationship between satisfaction and crowdedness in open space. This means that the children who stated open space is

not crowded (92.5%, N = 49) are more satisfied with open space, compared to the other group (63.0%, N = 17). The results show that crowdedness has a negative effect on satisfaction from open space because satisfaction goes down when open space is crowded.

Table 8. Relationship between Crowdedness and Satisfaction from Open Space

Item			Satisfaction from open space NO	Satisfaction from open space YES	Total	Chi-Square P-Value
Open space is crowded.	NO	Count	4	49	53	$X^2 = 10.78$
		% within crowded open space	7.5	92.5	100.0	P = 0.002
	YES	Count	10	17	27	
		% within crowded open space	37.0	63.0	100.0	
Total		Count	14	66	80	
		% within crowded open space	17.5	82.5	100.0	

4. Relationship between Satisfactions and Visibility

Regarding visibility, the children were asked whether they could see home windows from open space. The result of Table 6 shown that 45.0% of children (N = 36) answered Yes and 55.0% (N = 44) stated they cannot see their home windows from open space. The Chi-square test was employed and no significant relationship was found between two category groups of children at $X^2_{0.45}$; P = 0.359.

5. Relationship between Satisfactions and Fear of Darkness

The children were asked whether they are afraid of darkness in open space. While 77.5% of them (N = 62) answered No, 22.5% (N = 18) stated that they were afraid of darkness in open space. In addition, when the Chi-square test was performed, a significant relationship was found between category groups at $X^2_{4.03}$; P = 0.045. The results show the relationship between satisfaction and fear of darkness in open space. In this relation, 87.1% of the children who stated that they are not afraid of darkness in open space (N = 54) are more satisfied with open space than those who said to be afraid of darkness (66.7%, N = 12). Concerning children's fear of darkness and satisfaction from open space, the results reveal that children level of satisfaction goes down when they are afraid of darkness in open space.

6. Relationship between Satisfactions with Dirty and Unclean Areas

In reply to the question whether their open space is dirty, 70.0% of the children (N = 56) answered No and 30.0% (N = 24) stated Yes. Based on the Chi-square test, a significant relationship was found between the two groups of children at $X^2_{9.50}$; P = 0.004. As the result shows, while 91.1% of children (N = 51) do not find their open space dirty and are satisfied with it; 62.5% of them (N = 15) believe their open space is dirty, then they are not satisfied with it. Therefore, it can be concluded that dirty open spaces affects the level of children's satisfaction in a negative way.

7. Relationship between Satisfactions and Fear of Injury

Regarding safety items, the children asked whether they are afraid of being injured in open space. Accordingly, 82.5% of the children (N = 66) answered No and only 17.5% of them (N = 14) stated Yes. Moreover, the Chi-square test was performed; and a significant relationship was found between the two groups of children at $X^2_{12.42}$; P = 0.002. As well, the results show 89.4% of children (N = 59) stated they are not afraid of being injured in open space and are satisfied with their open space. Meanwhile, 50.0% of children (N = 7) said that they are afraid of being injured and are not satisfied with their open space. It revealed that those who are not afraid of being injured in open space are more satisfied with open space than the next group. According to the results, the children who have fears regarding injury in open space are less satisfied with their open spaces.

8. Relationship between Satisfaction and Fear of Car Accident

Regarding perceived safety, finally, the children asked whether they are afraid of car accident in open space. The results reveal that 63.7% of the children (N = 51) answered No, and 36.3% of them (N = 29) stated Yes. In addition, based on the Chi-square test, a significant relationship was found between the two groups of children at $X^2_{9.09}$; P = 0.004. As results shown, 92.2% of the children (N = 47) stated that they are not afraid of car accidents in open space and are satisfied with their open space; whereas 65.5% of the children (N = 19) said that they are afraid of car accidents and dissatisfied about their open space. It can be assumed that, in comparison to the ones who are afraid of car accident in their open space, those who are not afraid of such things are more satisfied with open spaces. Similar to those children who are afraid of injury, the ones who have fears regarding car accident in open spaces are less satisfied with their open spaces.

In summary, the all results of perceived safety show that children's satisfaction from open space has a significant relationship with safety, crowdedness, dirtiness, fear of darkness, probable injury and car accident in open space. However, there is no significant relationship between preference for open space and visibility of open space from home windows. Therefore, except two items in related to children's favorite spaces and home visibility; other six items including crowdedness, dirtiness, fear of darkness and car accident in open spaces can be considered as negative safety items which decrease the level of children's satisfaction. It is interesting that all negative objects have significant

relationships with children's satisfaction from open space.

3.4. Familiarity with open space

To understand if children's familiarity with open space relates to their satisfaction, asked them four questions about the visibility of open space for their parents, frequency of visiting, the time spent and accessibility to open space. Regarding visibility, data were analyzed descriptively to understand their children's relationship with satisfaction. Descriptive results using categorical answer Yes or No show that half of the children (50.0%, N = 40) think their parents can see them from their apartment windows. An almost equal number of them (48.8%, N = 39) do not think they can be seen from home windows. Only one child did not reply this question.

3.4.1. Visibility of open space

This study would like to investigate if the visibility of open space for parents affects children's satisfaction from open space. It was considered whether the children's playground or activities could be viewed from apartment windows by parents and if there was the capability to call them from windows in open space. Accordingly, the children were asked whether their parents could see them from the windows. However, when the Chi-square test was employed to examine the relationship between visibility and satisfaction from open space; the results showed no significant relationship between the two groups of children and satisfaction at $X_{21.64}$; P = 0.162.

3.4.2. Frequency of Visiting Open Space

When the children were asked about how often they go to open spaces around home, 52.5 % of them (N = 42) answered with the option 'very often'; whereas 47.5% of them (N = 38) answered with 'sometimes'. To test if frequency of going to open space relates to children's satisfaction, the Chi-square test was performed and a significant relationship was observed between the two groups of children at $X^2_{6.57}$; P = 0.011. Furthermore, as shown in Table 5.19, 92.9% of the children (N = 39) who go to open space more often are satisfied with open spaces. Meanwhile, 71.1% of the children (N = 27) who sometimes go to open space are satisfied. It means that the children who go to open space more often are more satisfied with open space. According the results,, it is found when the children spend much more time in open space; they are satisfied with open spaces.

3.4.3. Time Children Spend in Open Space

Children were also asked what time they go to the open space. They answered this question in four Likert scale (1-morning, 2-afternoon, 3-evening and 4-early night). Based on the results, 63.8% of children (N = 51) go to open space in the evening and 25% of them (N = 20) go to open space in the afternoon. Meanwhile, only 7.5% (N = 6) and 3.7% (N = 3) go to open space early night and in morning respectively. Furthermore, the Chi-square test showed no significant relationship between all these groups of children at $X^2_{6.16}$; P = 0.104.

3.4.4. Accessibility to Open Space

To investigate the accessibility of open space in term of going there in the company, the children were asked how they go to the open space. They answered this question in four Likert scales (1- alone, 2- with parents, 3- with sibling and 4-with friends). As shown in Table 9, the result reveals that 37.5% of them (N = 30) go to open space with parents, 32.5% (N = 26) goes with friends, 20.0% (N = 16) alone and 10.0% (N = 8) with a sibling. In line with the results, the Chi-square test found no significant relationship between the groups of children at $X^2_{3.37}$; P = 0.338.

Table 9. Descriptive Analysis of Children's Satisfaction in Relation to Accessibility of Open Space

Item	Alone	With Parents	With Sibling	With Friends
How do you go to open space?	N = 16	N = 30	N = 8	N = 26
	20.0%	37.5%	10.0%	32.5%

4. Conclusions

This paper analyzed children's satisfaction from open space as the main dependent variable. In addition, the study results regarding children make an effort to find relationship between satisfaction and the factors affecting it. These factors are safety, preferred activities and familiarity.

The finding of this paper suggests that children are satisfied with their open space overall and are affected by their preferences and physical activities for open space. Accordingly, preference for children's areas is more than soft landscapes, recreation and social spaces and, free games are more preferred than tool games and field games. Furthermore, children perceived that open space is safe. However, they stated that crowdedness, dirtiness, fear of injury, car accident and darkness have negative effect on their satisfaction from open spaces. Lastly, they revealed that watching television a lot has negative effect on their satisfaction from open spaces, whereas spending more time in open space has a positive effect.

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