

# Children's indoor and outdoor play patterns in Ahwaz city: implications for injury prevention

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أنماط لعب الأطفال داخل المنازل وخارجها في مدينة الأهواز: أثرها على الوقاية من الإصابات

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**الخلاصة:** تناولت دراسة شملت عدّة قطاعات بمدينة الأهواز، بجمهورية إيران الإسلامية، أنماط لعب الأطفال داخل المنازل وخارجها. وقام نحو 952 تلميذاً تتراوح أعمارهم بين سن السابعة والتاسعة، و942 من الآباء باستيفاء الاستبيان. وقد تركّزت الأنشطة المفضّلة لدى الأطفال في: كرة القدم (22.3%)، وركوب الدراجات (13.2%) ومشاهدة التلفاز (12.3%). والمُلاحَظ أن هذه النتائج جاءت مخالفة لما يراه الآباء، حيث أعطوا أكبر درجة لمشاهدة التلفاز (20.3%)، ثم لعب كرة القدم (13.3%)، ثم اللعب في الشارع (11.4%). وقد حدّد الأطفال الأماكن التي يفضّلونها للعب كما يلي: الشارع (27.4%) ثم المتنزهات أو الملاعب (18.3%) والمنزل (17.8%). وقد وُجد بطبيعة الحال تفاوت كبير في أنماط اللعب بحسب العمر والجنس. والمهم أن أنماط لعب الأطفال الذين هم أكبر سنّاً والفتيان منهم على وجه الخصوص، تعرّضهم لمواقف مخاطرها أكثر من مخاطر أنماط لعب الأطفال الذين هم أصغر سنّاً أو الفتيات.

**ABSTRACT** A cross-sectional study in Ahwaz city, Islamic Republic of Iran, described children's indoor and outdoor play patterns. A total of 952 pupils aged 7 and 9 years and 942 parents completed questionnaires. Children's favourite activities were: playing football (22.3%), cycling (13.2%) and watching television (12.3%). This differed from those perceived by the parents who reported watching television (20.3%), playing football (13.3%) and playing in street (11.4%). Children reported their favourite places to play were: street (27.4%), park/playground (18.3%) and home (17.8%). There were significant differences in play patterns by age and sex. The play patterns of older children and boys exposed them to more hazardous situations than younger children and girls.

## Loisirs des enfants à l'intérieur et à l'extérieur du foyer dans la ville d'Ahwaz : implications pour la prévention des traumatismes

**RÉSUMÉ** Une étude transversale réalisée dans la ville d'Ahwaz (République islamique d'Iran) a décrit les types de loisirs des enfants à l'intérieur et à l'extérieur du foyer. Au total, 952 enfants âgés de 7 et 9 ans et 942 parents ont rempli des questionnaires. Les activités préférées des enfants étaient les suivantes : jouer au football (22,3 %), faire de la bicyclette (13,2 %) et regarder la télévision (12,3 %). Ceci différait de celles perçues par les parents qui mentionnaient regarder la télévision (20,3 %), jouer au football (13,3 %) et jouer dans la rue (11,4 %). Les enfants ont déclaré que leurs lieux préférés pour jouer étaient la rue (27,4 %), le parc/terrain de jeu (18,3 %) et la maison (17,8 %). Il y avait des différences significatives dans les types de loisirs en fonction de l'âge et du sexe. Les types de loisirs des enfants plus âgés et des garçons les exposaient à plus de risques que les enfants plus jeunes et les filles.

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## Introduction

Many children's unintentional injuries, particularly after the age of 5 years, occur while playing outdoors [1,2]. Play-related injury is common among children, and in some cases causes severe injury and death. In the United Kingdom, around 1.2 million children are injured outside the home every year and children aged 5–14 years old have 85% of non-home injuries [2]. In many inner city areas there is nowhere safe for children to play, and these are the areas where the casualty rate for children is high [3]. Children who spend most of their free time outdoor participating in games or other activities are more likely to be exposed to hazards than children who spend their time indoors.

Higher rates of outdoor injuries are found in older children, and boys compared with younger children and girls [4]. This variation might be due to the mechanism of injury, behavioural differences or environmental factors [1,5]. Fabes et al. [6] showed that with increasing age, children increased the time they spent outside, and that boys play more physically energetic games than girls. The types of injury also differed between boys and girls. Towner et al. [7] showed that exposure to injury risk in schoolchildren aged 11–14 years varied with sex and age. They showed that boys, and older children were more likely to be exposed to greater risk than girls and younger children. Some studies have shown that the high injury rates among different groups of children resulted from greater numbers of roads crossed [8,9]. Other studies have examined the contribution of the traffic environment [10,11], the role of educational programmes, [12,13] and the role of the physical environment [14,15].

Nevertheless, the role of children's play patterns on risk of after-school accidental

injuries among primary school age groups is not clear and no survey evidence exists about the amount of time children in the Islamic Republic of Iran spend playing in the streets. The aim of this study is to determine children's play patterns in Ahwaz city, Islamic Republic of Iran, in order to gain an understanding of the proportion exposed to risk through outdoor play.

## Methods

The target groups were children in primary school classes 1 and 3 (children aged approximately 7 and 9 years old) living in the city of Ahwaz, Islamic Republic of Iran, and their parents. These age groups were chosen because the children are physically and behaviourally vulnerable in risky situations [16], and are learning to adapt to adult society. The methods and rationale behind this method have been published before [17].

The target sample size, calculated from a pilot study, was 952 pupils from 61 700 pupils in class 1 and class 3 of 400 primary schools. A total of 76 schools from 5 educational authority wards of the city were randomly selected according to the frequency of pupils in each ward and all the selected schools agreed to cooperate. The socioeconomic status of the subjects was assessed based on the ward level of census data on the proportion of the economically active population either employed, living in private households, living in a household with a car, or living in a home with not more than 1 person per room.

The selected children and their parents completed questionnaires. The children completed a simple questionnaire during a school lesson with adult supervision (teacher and research assistant). They were asked to paste different response stickers

onto pictures about play situations (e.g. yes/no, safe/dangerous). To make it appealing and easy to answer, the questionnaire included some cartoons and drawings. (The questionnaire is available on request from the author). The parents' questionnaire was taken home to parents by the children and delivered back by the pupils after completion. Parents' questionnaires that were not returned within 15 days were excluded. To maximize the response rate, a letter from the headteachers was enclosed to encourage parents' cooperation. The questionnaire had been tested before in the UK [17] and translated into Farsi for this study. The data from the schools were collected during October 2000. Parents reported the time, on average, that their children spent playing outside the home after every school day when the weather was dry and wet.

The data were analysed with the statistical package *SPSS* for Windows, version 10.0. The chi-squared test was used to calculate the associations between categorical data, Mann-Whitney test for calculating the significant differences of non-normal distribution and numeric data, and 95% confidence interval for differences. McNemar test was done to test paired proportions (based on the frequencies of pairs with different outcomes) between the parents' and children's responses.

## Results

Out of 952, a total of 942 pupil questionnaires (98.9%) and 832 parent questionnaires (88.3%) were completed.

### Children's favourite activities

Table 1 shows children's favourite activities with respect to age and sex, based on parents' and children's responses.

Playing football was their favourite activity according to 23.3% of children.

Seven-year-olds were more likely to say they prefer to play with toys than 9-year-olds ( $P = 0.005$ ). Nine-year-olds were more likely to prefer to play football than 7-year-olds ( $P = 0.006$ ). Girls were more likely to prefer to watch television ( $P = 0.013$ ), read or draw ( $P < 0.001$ ) and play with toys ( $P = 0.009$ ) than boys. However, boys were more likely to prefer to play with a computer ( $P < 0.001$ ) and play football ( $P < 0.001$ ) than girls. There was no significant difference between other activities by age and sex.

Many parents reported that the favourite activity for both age groups of children was watching television (23.4% and 20.6%). They said that older children were more likely to prefer to play football ( $P = 0.041$ ) than younger children. According to parents, boys were more likely to prefer to play football ( $P < 0.001$ ) and play with a computer ( $P = 0.013$ ) than girls. Girls were more likely to prefer to play with friends ( $P = 0.002$ ) and to draw or read ( $P = 0.002$ ) than boys.

Table 2 shows the proportion of occasions when parents agreed with children about their favourite activities. Overall, there was poor agreement between parents' and children's responses for all individual activities (excluding "other sports", the proportions agreeing ranged between 0% and 53.1%). There was poorer agreement between parents and children for outdoor play activities than indoor play activities, e.g. playing (14.8%) and cycling in the street (21.6%). About half the parents disagreed with their children's responses on favourite activities in outdoor play.

### Children's favourite places to play

Table 3 shows children's responses about their favourite place to play. This shows that the street was the favourite place to play for more than a quarter of children. Seven-year-

Table 1 Children's favourite activities as reported by parents and children by age and sex

Activity	Age 7 years %	Age 9 years %	Boys %	Girls %	Total %
<i>Watching TV</i>					
Parents	23.4	20.6	25.3	18.6	22.0
Children	13.6	11.1	8.8	16.4	12.3
<i>Football</i>					
Parents	10.9	18.3	25.8	2.2	14.4
Children	17.4	27.9	34.9	8.2	22.3
<i>Playing in street</i>					
Parents	11.9	12.8	10.1	14.8	12.3
Children	6.6	6.6	3.2	10.5	6.6
<i>Playing with friends</i>					
Parents	12.4	8.9	6.1	15.8	10.8
Children	7.4	5.3	6.0	6.8	6.4
<i>Drawing/reading</i>					
Parents	10.0	7.8	4.5	13.7	8.9
Children	5.8	5.8	1.2	10.9	5.8
<i>Cycling</i>					
Parents	7.5	7.2	9.1	5.5	7.3
Children	14.5	11.9	15.1	10.9	13.2
<i>Computer</i>					
Parents	7.0	6.1	9.6	3.3	6.6
Children	9.5	8.4	13.5	3.6	8.9
<i>Playing with toys</i>					
Parents	5.0	4.4	3.0	6.6	4.7
Children	14.0	6.2	6.8	14.1	10.2
<i>Other sports</i>					
Parents	4.0	6.1	4.0	6.0	5.0
Children	1.7	4.0	1.6	4.1	2.8
<i>Other indoor play</i>					
Parents	3.0	3.9	0.5	6.6	3.4
Children	2.5	0.9	1.6	1.8	1.7
<i>Other outdoor play</i>					
Parents	2.0	2.8	2.0	2.7	2.4
Children	4.5	7.1	4.4	7.3	5.8
<i>Total number of parents<sup>a</sup></i>	402	360	396	366	762
<i>Total number of children<sup>a</sup></i>	484	452	498	438	936

<sup>a</sup>Totals less than 942 are due to missing data on questionnaires.

olds were significantly more likely to prefer to play in the home than 9-year-old children ( $P < 0.001$ ). However, 9-year-olds were more likely to prefer to play in the field ( $P =$

Table 2 Proportion of occasions when parents agreed with children's assessment of their favourite activities

Parents' responses	Children's responses										
	Watching TV	Playing with toys	Drawing /reading	Computer	Playing in street	Football	Cycling	Playing with friends	Other sports	Other indoor play	Other outdoor play
%	%	%	%	%	%	%	%	%	%	%	%
Watching TV	53.1	20.9	13.6	25.7	11.1	14.9	17.6	20.0	22.2	16.7	9.1
Playing with toys	2.0	14.0	13.6	0.0	7.4	0.0	9.8	4.0	0.0	0.0	0.0
Drawing/reading	2.0	14.0	40.9	2.9	0.0	2.7	5.9	12.0	0.0	33.3	18.2
Computer	0.0	4.7	4.5	22.9	11.1	8.1	3.9	4.0	0.0	0.0	9.1
Playing in the street	10.2	18.6	0.0	8.6	14.8	9.5	17.6	16.0	0.0	16.7	9.1
Football	2.0	2.3	0.0	17.1	11.1	44.6	9.8	12.0	0.0	16.7	4.5
Cycling	2.0	2.3	0.0	2.3	0.0	6.8	21.6	4.0	11.1	0.0	4.5
Playing with friends	12.2	14.0	4.5	2.9	40.7	5.4	5.9	20.0	11.1	16.7	4.5
Other sports	6.1	4.7	4.5	0.0	0.0	4.1	2.0	8.0	55.6	0.0	9.1
Other indoor play	6.1	2.3	9.1	0.0	3.7	1.4	2.0	0.0	0.0	0.0	13.6
Other outdoor play	2.0	0.0	4.5	2.9	0.0	1.4	2.0	0.0	0.0	0.0	18.2
Total number of respondents <sup>a</sup>	98	86	44	70	54	144	102	50	18	12	44

<sup>a</sup>Totals less than 942 are due to missing data on questionnaires.

Table 3 Children's responses to their favourite places to play after school hours

Place of play	Age 7 years (n = 484) %	Age 9 years (n = 458) %	Boys (n = 502) %	Girls (n = 440) %	Total (n = 942) %
Street	25.6	29.3	27.1	27.7	27.4
Park/playground	17.4	19.2	17.1	19.5	18.3
Home	24.0	11.4	15.9	20.0	17.8
Garden/hut	14.1	10.9	10.8	14.5	12.6
Field	6.6	14.4	15.1	5.0	10.4
Friend's house	1.2	8.3	3.6	5.9	4.7
Back lane	5.4	2.6	4.8	3.2	4.0
Club	0.8	2.2	1.6	1.4	1.5
Building site	2.1	0.4	0.8	1.8	1.3
Others	2.8	1.2	3.2	1.0	2.1

0.006) and a friend's house ( $P < 0.001$ ) than 7-year-olds. Boys were more than 3 times more likely to prefer to play in the field than girls ( $P < 0.001$ ). There was no significant difference between other responses for the sexes.

#### Children's usual activities after school hours

Overall, 74.5% of children reported that they usually played in the street every day after school. Nine-year-olds were more likely to play in the street every day than 7-year-olds (79.5% versus 69.8%,  $P = 0.016$ ). Boys also were more likely to play outside the home compared with girls (78.5% versus 70.0%,  $P = 0.035$ ).

Table 4 shows how much time parents estimated that their children spent in play the day before by age and sex. On average, children spent 127 minutes indoor, 48 minutes in the street, 12 minutes at a children's club, 4 minutes in the park, 1 minute in the playground and 15 minutes on other places. There were no significant differences by

age group and sex of children in the amount of time they spent in play the day before.

Children of all groups spent a mean time of 107 min (standard deviation = 82) playing outside when the weather was dry and 12 min (SD = 33) when the weather was wet every day after school. Regarding the time spent playing outside when it was dry, there was no significant difference between 7- and 9-year-olds and boys and girls. There was no significant difference between other groups of children in the time spent playing outside when it was wet, and time spent playing in the home.

Parents were asked whether their children usually play in the street, park or playground, sport/leisure centres and other places after school, every day. The responses were recorded as "sometimes" and "never". According to parents' responses, 7-year-old children were more likely to play in the playground than 9-year-old children (44.0% versus 33.5%,  $P = 0.028$ ), while 9-year-olds were more likely to play in the street than 7-year-olds (84.0%

Table 4 Parents' responses to how much time their children spend after school in play in different places the day before completing the questionnaire

Place of play	Age 7 years (n = 484)		Age 9 years (n = 452)		Boys (n = 498)		Girls (n = 438)		Total (n = 936)	
	Mean (min)	% of children playing	Mean (min)	% of children playing	Mean (min)	% of children playing	Mean (min)	% of children playing	Mean (min)	% of children playing
Indoors	131	89.3	123	87.1	124	86.4	131	90.1	127	88.2
In the street	45	45.1	52	50.0	55	49.3	41	45.5	48	47.5
At a club	12	13.7	13	13.0	12	13.2	13	13.6	12	13.4
In the park	4	4.9	5	5.5	6	6.6	3	3.5	4	5.1
In the playground	1	1.9	2	2.5	1	2.4	2	2.0	1	2.2
In other places	11	10.4	20	18.5	17	16.0	13	12.8	15	14.4

Totals less than 942 are due to missing data on questionnaires.

versus 75.5%,  $P = 0.031$ ). With respect to sex, there was no statistically significant difference between the 2 groups relating to different activities.

Nearly two-thirds (64.7%) of parents thought that there was a dangerous place for their children near their home within 5 minutes walk. Nevertheless, 29.3% of their children played there. There was no statistical significant difference between parents' views on dangerous place/s near their home by age or sex of the children.

## Discussion

This study showed that many children in Ahwaz city usually play outside their home and spend most of their after-school hours outdoor in the street. Streets were the favourite place to play for more than a quarter of children. Older children and boys had different play patterns than other groups of children. This exposes them to hazards that increase the risk of injuries. Older children spent more time in play outdoors compared with younger ones, as did boys compared with girls, and they were more likely to play outdoors without an adult, exposing

them to more hazardous situations. Parents of different groups of children had different views about their children's activities after school. This could reduce their potential influence on preventing injuries.

This study obtained a very good response rate (98.9% for children's and 88.3% for parents' questionnaires), higher than the response rate of studies that used a similar method for collecting parental information [17,18], or children's data [7]. It is unlikely that parents could remember accurately how much time their children spent in various type of play, so the times should be considered as estimates. Also, weather conditions varied between the days of data collection, which also could have affected the findings. The number of children in the family, and which guardian/parent is answering may also influence the subject's responses.

Little has been written about children's play patterns and the need for children to play outdoors in safety alone or with their friends. According to one US survey by Thackray and Dueker [19], 90% of children of 6–7 years of age played in the streets without an adult, and Sadler [20] found that three-quarters of all the schoolchildren spent

some time after-school hours playing away from home. Chapman et al. [21] believed that many injuries occur when children use streets as play areas. Tight [22] examined the exposure of children (pre-school, primary school and secondary school) to risk while using roads for reasons other than going to and from school, with particular emphasis on play. In terms of age alone, he found that 38.2% of children observed in the street were of primary school age, which was greater than pre-school (35.3%) or secondary schoolchildren (26.5%). Of all children, 66.6% were involved in some type of play activities in the street.

Earlier studies on children's play patterns give a general picture of the type of use that children make of the street for playing. This study found that about two-thirds of children play outside every day after school. Some of them played near dangerous places and did not like to use playgrounds or play areas in their neighbourhood. This result can be used to inform efforts to improve the safety of residential streets, and to make playgrounds more attractive for children.

A previous study in Ahwaz showed that almost as many girls as boys were observed to visit dangerous places in their neighbourhood [5]. There was, however, a tendency for a more boys to be found in traffic areas. Chapman et al. [21] showed that boys more than girls use streets for recreational purposes. The findings of the present study are similar for many outdoor activities not only by the child's sex but also by age.

Parents have to weigh up the risks of children's outdoor activities. For child pedestrian injuries, it has been shown that one possible cause is a relative mismatch between the children's risk perception, children's skills and the parents' expectations [23]. Surveys suggest that parents have unrealistic expectations of their children's pedestrian skills [18]. In this study, the street

was the favourite place to play for more than a quarter of children. One explanation may lie in the benefit of playing outside perceived by both parents and children. Another explanation may be that these groups of children live in houses without gardens where they can play or in areas without children's preferred play facilities.

Playgrounds and play areas can provide an alternative to playing in dangerous places such as roads [1,3,5,24]. The results of the present study showed that providing a play area close to home will not be enough because although most children had access to a play area within less than 10 minutes walk, only half of them usually played there. The message is clear; children are not attracted to many play areas probably because available playgrounds are not interesting enough for children and need to be modified [25]. Therefore it will be important to provide adequate safe play areas close to home, where children can enjoy the play equipment or play facilities (for instance, football playgrounds or appropriate places for cycling).

Some after-school injuries may be avoidable by changing the nature of children's play patterns (e.g. by emphasizing the avoidance of street play) or by incorporating minimal safety precautions. Other means of reducing after-school injuries might be through modifying features of residential areas where children usually like to play, and through education. One of the greatest improvements in the safety of play outside the home may occur if children learn to transfer the principles and habits of safety they learn in their education programmes to non-organized activities. The gains will come when children recognize the danger of unsafe activities and policy-makers establish organized after-school programmes [26].

In conclusion, even if built-up areas where children play outside are made safer,



their play patterns might expose them to other dangerous situations, such as falling from heights, from bicycles and so on. Many after-school injuries and mainly child pedestrian injuries in different geographic areas tend to be scattered diffusely rather than clustered [27]. Therefore, it seems that environmental improvements such as traffic engineering interventions at “black spot” locations will not cover all the children who usually play outside after school and are at risk. Therefore, changing children’s play

patterns and putting emphasis on avoiding unsafe activities by providing organized after-school programmes, considering children’s favourite activities especially for vulnerable children is recommended. In addition, parents should discourage children from playing in unsafe places or taking part in some risky activities without supervision or adequate safety devices. Further studies are required to determine which of these strategies has the greatest potential to reduce after-school injuries in children.

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