

INJURIES OF CHILDREN AND ADOLESCENTS IN HOME AND SCHOOL ENVIRONMENTS

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Abstract

In view of the current lack of epidemiological data with detailed information and analysis of the causes of injuries in the home and school environments, a study of children's injuries is being conducted in the South-Bohemian administrative region. The study aims to analyse injuries of children age 0–18, including the most frequent injury locations, mechanisms and other factors relevant to the occurrence of injuries. Data on children who sought medical treatment of injuries during the period from October 2009 to September 2010 were collected by engaging general practitioners for children and adolescents. A total of 568 completed questionnaires entitled "Child injury/intoxication" were collected during the study period; 220 questionnaires included information regarding injuries in home environments and 87 questionnaires included information regarding injuries in school environments.

The study results show that children 0–3 contribute a high fraction (40%) to injuries at home. Boys were involved to a higher extent (57%) than girls (43%). Injuries happened most frequently during plays (55%) in the garden (23%) or in the kitchen (19%). Surfaces were the immediate causes of the injuries frequently (29%). As to the injury mechanism, falls predominated (36%), causing open wounds in 33% cases. The upper limbs were injured in 33%. Mere 20% families had some safety devices in their homes such as furniture corner protectors or baby socket protectors. In the school settings, boys and girls are involved in injuries to a nearly identical extent: boys 51%, girls 49%. The most endangered age group is age 11–14 (37%). Impact was the most frequent (31%) mechanism of injury; the upper limbs were injured in 39% cases; bruises were involved in 28% injuries; and 38% injuries happened in the gymnasium during classes (39%). Injuries occurred during sports activities in 49%; surfaces were the immediate dangerous objects in 38%; 6% injuries were classed as intentional.

The causes, types, circumstances and other factors of injuries in the group of children that received medical treatment for injury during the study period did not differ from those reported in available literature.

Key words: *child – injury – home – household – school South-Bohemian region*

INTRODUCTION

Injuries, particularly among children and adolescents, are becoming an issue of social interest in all developed countries

worldwide. This is so because injuries are, among other things, the most frequent causes of death or permanent disablement of children and adolescents. Injuries and their consequences are not only a health

and social issue; in fact, they constitute a considerable economic burden. In view of this, increased attention should be paid to the issue of child injuries: the causes of injuries, places where injuries occur most frequently, prevailing types of injuries in the various age groups and other relevant factors should be identified, and based on the findings, effective and efficient primary prevention measures should be devised and adopted (Marádová 2003, Čapková et al. 2008).

As regards the locations where injuries occur, the home environment is the most hazardous setting (Benešová 2003). Safety of the home environment is the main issue with respect to the child's healthy development. Although parents make considerable efforts to create a safe and peaceful home for their children, surveys show that nearly two-thirds of accidents involving children up to 14 and roughly one-third of accidents involving adolescents occur at home (Benešová and Nencka 2008). It is often believed that "accidents happen by accident" and nothing can be done against them. In reality, however, the majority of accidents can be prevented. Each accident has its cause, and causes can be eliminated. Just a little more attention and information, and a home can be made safer at very little cost (Benešová and Nencka 2008). Child injuries are affected by children's age peculiarities, environment they live in, and their upbringing. Each age range has its typical spectrum of injuries, and so the risks that devote attention for a particular child age can be assessed. Falls are the most frequent causes of injuries, and home building components such as floors, tiles, staircases, doors and glass surfaces are involved. The consequences of falls, though, are not very serious. Although less frequent, burns constitute severe injuries, sometimes fatal. Dangerous locations include kitchens, bathrooms, living rooms and gardens. Hazardous activities include cooking, bathing, and handling of flammable materials, poisonous substances and electricity. About 20% injuries at home can be ascribed to a too dangerous environment. In fact, environment which suits adults may be dangerous to children. The remaining fraction of injuries is due to coincidence or to failure to make the child familiar with existing hazards. The solution is not in isolating the child from everyday situations and things; in fact, it

consists in making the child (at a suitable age) familiar with a proper use of things, so that the child should not get experience through pain and, in particular, so that severe and fatal injuries should be avoided. The home should be a safe shelter, a place where the child feels well and where its parents need not fear that the child may suffer injury (Benešová 2003).

School is another hazardous setting as regards child injuries. School injury is an injury suffered by a pupil or student during classes or during care in pre-school or off-school facilities. The most frequent types of injury at school include falls, injuries due to damaged equipment and devices, and bruises suffered during collisions or fights. Many accidents occur in classrooms, corridors and gymnasiums, mostly while no teacher is present. For injury prevention to be efficient, the importance of prevention must be supported particularly by complying with the basic rules. The Czech School Act (Act No. 49/2009) stipulates that school facilities are responsible for assuring pupils' safety and protection during activities that are directly related to education. Schools should identify, assess and evaluate hazards in relation to pupils' environment and activities, create pre-conditions for pupils' safety and protection taking into account pupils' age, abilities and maturity, and supervise compliance with safety rules. In parallel, children should be made familiar with safe behaviour rules, and efforts should be made for the pupils to understand how important it is to adhere to the rules (Marádová 2003). Although all this is well-known, the incidence of injuries has been increasing constantly during the past years. It is general knowledge that child injury rate is too high in the Czech Republic and effective preventive measures must be adopted, the situation in the area of school injuries is getting worse and worse (Skácelík 2006, 2007). Existing preventive provisions of legislative or technical nature have had no favourable impact on this trend so far. Although the majority of school injuries has been reported not to be very severe, the increasing injury rate is alarming, and increased attention should be paid to this issue. Among institutions that monitor statistically injuries at schools and school facilities is the Czech School Inspectorate (CSI), which has been recording injuries of children and students since 2005

based on the new School Act and Regulation No. 64/2005. Based on current legislation, schools are required to send injury records to the relevant regional school inspectorates. The CSI Headquarters collects the data from the regional inspectorates and processes them (Škodáček 2003, Skácelík 2007, Učitel'ské noviny 2010).

In view of the current lack of epidemiological data with detailed information and analysis of the causes of injuries in the home and school environments, a study of children's injuries is being conducted in the South-Bohemian administrative region.

MATERIAL AND METHODS

A project for the 2009–2011 period is under way in the South-Bohemian region to collect data on children who have been treated for injury by general practitioners for children and adolescents during the project period. Active cooperation with 10 general practitioners for children and adolescents within the South-Bohemian administrative region is maintained for the study. The study aims to analyse injuries of children age 0–18, including the most frequent injury locations, mechanisms and other factors relevant to the occurrence of injuries.

Injuries in the home and school environments were followed within the research from October 2009 to September 2010. The partial results achieved during that period are presented in this paper. So far, 568 questionnaires have been collected. From among those, 220 questionnaires described injuries that occurred at home and 87 questionnaires described injuries that occurred at school. The remaining 261 questionnaires pertained to traffic injuries, injuries suffered during sports and leisure activities, injuries at work and, in addition, intoxication.

In order to obtain relevant data, a questionnaire on "Child injury/intoxication" was set up based on the previous "Child injury record sheet". The "Child injury/intoxication" questionnaire contained identification questions about the gender and age of the child. Age groups were set up matching the children's

development stages: 0–3 baby/early childhood; 4–6 preschool age; 7–10 younger school age; 11–14 older school age, pubescence; 15–18 adolescence. The parameters followed also included the month of the year during which the injury occurred; type of medical care provided (outpatient treatment, inpatient hospital treatment, ...), need for surgery, and factors relevant to the occurrence of the injury (use of narcotics; fatigue; sudden health handicap; no adult present to keep an eye on the child; ...). Both intentional and unintentional injuries were included. The next section of the questionnaire was devoted to the circumstances and details of the injury: frequency of injuries in the individual child during the study period, location, mechanism, type of injury, injured part of the body. The section dealing with injuries at home examined the most frequent locations of the injuries, activities during which the injuries happened, things that caused the injuries and safety devices used in the households. Both injuries occurring at home and during visits in homes of the child's relatives, friends, etc., were included. The section devoted to injuries in the school environment paid attention to the circumstances of the injuries: locations, time, activities, objects contributing to the injuries.

RESULTS

During the relevant period, general practitioners for children and adolescent in the South-Bohemian region furnished 568 completed "Child injury/intoxication" questionnaires describing injuries of children age 0 to 18. From among that number, 220 questionnaires described injuries at home and 87 questionnaires described school injuries.

Home injuries

A total of 126 (57%) boys and 94 (43%) girls suffered injury in the home environment. Divided by age, most frequent were injuries of children 0–3, viz. 88 (40%) followed by the age group of 4–6, viz. 40 (18%) – see Table 1. The proportion of boys as compared to girls was higher in both age groups.

Table 1. Home injuries in the various children's age groups (N=220)

Age	Number	Percent fraction
0-3	88	40
4-6	40	18
7-10	26	12
11-14	40	18
15-18	26	12

As regards the months of the year, the highest number of injuries was recorded in July 2010, viz. 32 (14%) injuries, followed by August 2010, viz. 26 (12%) injuries. On the contrary, the lowest number of injuries, viz. 7, occurred in June 2010 followed by December 2009 (10 injuries). 136 (62%) children received first treatment from selected general practitioners for children and adolescents, 60 (27%) received first treatment at outpatient/emergency departments (surgery, traumatology, dentistry, ...), 24 (11%) children were treated at an institutional medical facility. From among the total of 220 (100%) injured children, 24 (11%) children were admitted to a hospital for their injury, 42 (19%) children were referred to a specialist (surgeon, orthopaedist, rehabilitation), 29 (13%) were treated as outpatients, and 119 (54%) children were treated and invited to a

next visit. Surgery was envisaged for 10 (42%) of the 24 hospitalised children. The actual number of surgeries was 9. The surgeries mostly consisted of a single procedure. The predominating factors that contributed to the occurrence of the injury included inadequate supervision by adults (66 injuries, i.e. 30%) followed by inattention/carelessness (39 injuries, i.e. 18%). Alcohol was involved in 1 injury. No contributing factor was specified for 102 (46%) injuries.

The mechanism of the injury was identified for all the 220 children. The immediate causes of the injuries included fall (78, i.e. 36%), impact/collision (42, i.e. 19%), slipping/tripping (35, i.e. 16%), and sharp objects (26, i.e. 12%).

Fall as the mechanism of the injury is statistically highly significant in the 0-3 age group (Table 2).

Table 2. Injury mechanism: fall

			Mechanism		Total
			<i>fall</i>	<i>other</i>	
Count	Age	0-3	41	48	89
		4-18	37	94	131
	Total		78	142	220
Adjusted residual	Age	0-3	++	--	
		4-18	--	++	

The predominating types of injury included open wounds (72, i.e. 33%), bruises (50, i.e. 23%), and fractures (23, i.e. 11%). Frequent injuries included distortion (8%), burns (7%), and scalds (6%). Choking due to the presence of a foreign object in the airways was involved in 2 cases, drowning was involved once (Table 3).

Injury of an upper limb (mostly fingers) was involved in 71 (33%) injuries, injury of a lower limb was involved in 50 (23%) injuries. The head was injured in 80 children. In this, the face (mouth, eye, forehead, nose, ear) was involved in 49 (22%) injuries, the brain section was involved in 31 (14%) injuries. Injury of the chest (3%), flank and spine, and multiple injuries were less numerous.

Table 3. Home injuries divided by the types of injury (N=220)

Type of injury	Number	Fraction (%)
Commotion	11	5
Bruise	50	23
Scrape	3	1
Open wound	72	33
Fracture	23	11
Luxation/dislocation	3	1
Distortion	17	8
Crush	2	1
Burn	15	7
Scald	14	6
Choking/asphyxia	3	1
Other	7	3

195 (89%) injuries were due to the child's fault, 20 (9%) injuries were due to another person's fault, while 5 (2%) causes of injury involved animals (dog: 4 injuries, insect stinging: 1 injury). No injury was classes as intentional. 13 (6%) children were identified as frequently injured individuals. The mean

frequency of injuries was 3 to 4 injuries per year.

The majority of injuries occurred in the garden (49, i.e. 23%), in the kitchen (41, i.e. 19%) and in the children's room (37, i.e. 17%), followed by the living room (25, i.e. 11%) and indoor staircase (15, i.e. 7%) – see Table 4.

Table 4. Injuries divided by the location of occurrence in the household

Location	Percent fraction
Kitchen	19
Living room	11
Children's room	17
Bedroom	6
Bathroom	6
Indoor staircase	7
Outdoor stairs	1
Garage	2
Garden	23
Other	8

The majority of injuries (121, i.e. 55%) occurred during the child's plays/game. Personal hygiene, bathing 8%) and sleep, and rest (7%) followed. 67 (29%) injuries were due to impact onto a surface (fall) and 39 (18%) injuries were due to impact/fall into/onto a piece of furniture. Other objects as the causes

of injuries were reported in 43 (20%) cases. Such objects included doors, animals, or working material.

From among the 220 cases, mere 45 (20%) households were fitted with safety devices (protectors). The following devices were used (more than one device could be checked in

the questionnaire): electric socket protectors /35), furniture corner protectors (24), window protectors (10), barriers against fall from the bed (9), and barriers on the top sections of staircases (8). None of the households was equipped with antislip pads, tapes or rings. No safety device was present in 73 (33%) households. No information regarding this issue was available for 102 (47%) households.

As to the households involved, 202 (92%) injuries occurred at the child's home, 18 (8%) injuries occurred in another household (at relatives' or friends' places).

School injuries

School injuries constituted a smaller fraction of injuries. Boys suffered 44 injuries, girls suffered 43 injuries at school (the boys-to-girls ratio was 51:49). As to the age groups, the age group of 11–14 predominated with 32 (37%) injuries, followed by age groups 7–10 (23 injuries, i.e. 26%) and 15–18 (18 injuries, i.e. 21%). As far as the month of the year is concerned, March was the most dangerous month of the school year (16 injuries, i.e. 18%), followed by October (13 injuries, i.e. 15%) – see Table 5.

Table 5. School injuries during the months of the school year (N=87)

Month	Number	Fraction (%)
January	8	9
February	6	7
March	16	18
April	10	12
May	4	5
June	6	7
September	10	11
October	13	15
November	9	10
December	5	6

First medical care was provided by the child's general practitioner (48 injuries, i.e. 55%), by outpatient departments (27 injuries, i.e. 31%) and by institutions (12 injuries, i.e. 14%). Four children had to be hospitalised. All of the 4 children underwent a single surgical procedure. 41 (48%) children received treatment and were invited to a next visit, 30 (34%) were referred to a specialist (surgeon, ophthalmologist, ORL) for additional treatment. The most frequently reported factors

that contributed to the occurrence of the injuries included inattention (11%) and inadequate supervision by adults (9%). The factors were unavailable for 67 (78%) injuries. From the total of 87 injuries, 5 (6%) injuries were identified as intentional, a foreign person being deliberately involved. 69 (84%) injuries were unintentional self-injuries, while another person was involved in 13 (16%) injuries.

Table 6. School injuries divided by the mechanisms (N=87)

Mechanism of injury	Number	Percent fraction
Slipping/tripping	21	24
Fall	26	30
Impact	27	31
Knock-down	11	13
Sharp object	1	1
Burn by a caustic substance	1	1

The most frequent mechanisms included impact (27 injuries, i.e. 31%), fall (26 injuries, i.e. 30%) and slipping/tripping (21 injuries, i.e. 24%) – see Table 6).

The types of injury mostly included bruises (24 injuries, i.e. 28%), distortion (18 injuries, i.e. 21%) and fractures (17 injuries, i.e. 20%). Open wounds were also rather frequent (15 injuries, i.e. 17%). From among the 87 injuries, 33 (39%) involved an upper limb and 22 (25%) involved a lower limb. The brain part of the head was involved in 8 (9%) injuries and the face part of the head was involved in 13 (15%) injuries. 4 (5%) children were identified as children with frequent injuries. They suffered 3 to 4 injuries annually in the average.

As to the places where the injuries happened, gymnasiums predominated (32 injuries, i.e. 38%), followed by classrooms (22 injuries, i.e. 25%). Canteens and staircases were least dangerous.

Injuries happened most often during sporting activities (42 injuries, i.e. 49%), either during classes (34 injuries, i.e. 39%) or during sports activities organized by the school (18 injuries, i.e. 21%). 14 (16%) injuries were due to the children’s running about the classroom or corridor during breaks – 25 (29%) injuries. Other activities such as visits to culture institutions or school trips were involved in 2% injuries (Table 7).

Table 7. School injuries divided by the time of occurrence (N=87)

Time of injury	Number	Percent fraction
Classes	34	39
Break	25	29
Free hour	6	7
Sporting activity	18	21
Practical training	1	1
Trip	2	2
Other	1	1

Objects causing injuries included surfaces (ground, soil, grass, asphalt, ...) (32 injuries, i.e. 38%), followed by sports equipment (23 injuries, i.e. 26%).

DISCUSSION

A total of 568 questionnaires with child injury data were collected within the South-Bohemian administrative region during the period in question. From this number, 220 injuries that occurred at home and 87 injuries that occurred at school were selected and processed for the present paper.

Home injuries

The boys-to-girls ratio in the home injury group examined matches other studies, indicating that the hazard of injury is higher for boys than for girls. The higher number of injuries in boys than in girls may be explained

in terms of the development and motor differences between the two genders. The frequency of injuries peaks in the 0–3 age group. This age group is considered one of the most endangered by injuries. Babies and little children are curious, active and, especially at the beginning, clumsy. Fatal injuries and intoxications are most frequent in babies. Falls, drowning, choking due to the inhalation of small objects (small nuts, beads, ...) are frequent types of baby injuries (Toráčová et al. 2006). In view of the location where babies and small children are mostly present, injuries at home clearly predominate. As the child grows older, it is more often present outdoors, in a vehicle or at school, and so those places also become the locations of injuries. Although the season of the year is an important factor affecting the injury-related activities and circumstances, no appreciably higher incidence of injuries was observed in any season of the period examined. It is

true that the number of injuries in the home environment increased somewhat during the holiday season, this increase, however, was not very dramatic. If the severity of injuries is assessed in terms of the primary treatment, then the fact is relevant that the first treatment of the majority of injuries was provided by general practitioners for children and adolescents. Treatment by hospital emergency/outpatient departments and subsequent hospitalization were needed for 11% children. And 10% of those children had to undergo surgery.

Factors that immediately affected the occurrence of the injury were also of interest. Regrettably, the factors failed to be ascertained for the majority of injuries. Frequently, injuries were only reported to be due to coincidence and unfavourable circumstances. This, however, is generally an improper identification. No injury is accidental, every injury has its causes and actually could have been prevented by adopting suitable measures. Injuries are often due to the child's inattentiveness or unwariness, or no adult kept an eye on the child. In fact, the presence and attention of parents or other persons taking care of the child is one of the main preventive factors for babies and small children and, conversely, absence of supervision is a significant risk factor. Just a few moments during which nobody keeps an eye on the baby or child, and the risk of injury is multiply higher. Parents' supervision is an important preventive element which substantially eliminates risk factors of the environment (Benešová 2003, Grivna 2003).

Impact (and slipping/tripping) were the most frequent injury mechanisms; in fact, this is so in all age categories irrespective of gender. Falls are the most frequent cause of injuries and, along with traffic accidents, also the cause of the most severe injuries. Falls often result in dangerous head injuries in babies and small children. A fall height of 60 cm is sufficient to cause severe injuries to children. Baby falls from the changing table and falls during the period the small child learns to walk are most frequent (Benešová 2003, Bezpečný domov 2009). Fall as the mechanism of the injury was identified by the research as statistically highly significant in the 0–3 age group. Also quite frequent were injuries caused by sharp objects, resulting in open wounds and/or

bruises. This is a very broad class of injuries encompassing situation from quite banal to life-threatening ones. Injuries caused by sharp objects are often associated with other injuries – falls, bites. Handling sharp objects is frequently the situation leading to an injury. Injuries caused by heat were also quite frequent. In babies and small children, such injuries can be caused by scalding, e.g. by hot liquids (tipping over, spilling) or burns due to contact with hot surfaces (electric hotplates, irons, fireplaces, heating). In older children, improper handling of fireworks pyrotechnics or fire is also involved. Electric current is also a cause of injuries in children. Burns and scalds are types of injury that can have severe, often life-long consequences and, in the worst case, can be fatal. In fact, child skin is thinner and more sensitive than adult skin, and so burns and scalds are always more severe in children. Such injuries, though, can be prevented by adhering to safety principles (Benešová 2003, Bezpečný domov 2009).

An upper and/or lower limb was the most frequently injured part of the body. Where upper limbs were involved, fingers were affected most, followed by the hand (palm, back of the hand, wrist). Where lower limbs were involved, injuries of the foot (ankle, sole, instep, heel) and toes predominated. The types of injury included fractures, bruises and luxations, dislocations and distortions. The head was injured in 36% children. The face part of the head (eye, mouth, forehead) was injured more frequently. The injury types included open wounds, bruises and scrapes.

Among important factors in injury prevention is knowledge of the environment, i.e. the place where injuries occur. As regards households, garden was identified as the most dangerous place, followed by kitchens and children's rooms. Kitchens contain many things which are interesting and, at the same time, dangerous to babies and small children. So kitchen deserves special attention in injury prevention efforts. The kitchen is often the centre of home activities, a favoured place for babies and small children to play at, and this is why it is also one of the most dangerous places in a home (Benešová and Nencka 2008). Also in the kitchen, many injuries can be prevented by using a variety of safety devices/protectors and by continuous supervision. Children's room is the place where children spend most

time without adult supervision. The furniture and equipment should be safe and match the child's age (Bezpečný domov 2009).

Among activities during which injuries happened was play, which is consistent with the typical children's age. Home building components such as floors, tiles, hard surfaces, staircases and furniture contributed to injuries most. Well-known provisions improving home safety should be applied when making any change in the flat or house. Such provisions include the use of safety devices/protectors; they may not be very expensive yet the child injury hazard can be thereby reduced as much as to one-half. This research confirmed that socket protectors, corner protectors and window protectors are the most frequent safety devices installed at households. Upper stair barriers were installed in 8 houses, such barrier on its own, however, is insufficient. Only barriers installed both at the upper and lower staircases can provide adequate protection.

All injuries that had happened in the home environment were classed as unintentional. Foreign persons were involved in 9% injuries, animals were involved in 2% injuries.

Fall as the mechanism of the injury is statistically highly significant in the 0–3 age group. No statistical significance was found for the remaining factors.

School injuries

The proportions of boys and girls who suffered injuries in the school environment were nearly identical. From the age aspect, the 11–14 age group was involved most frequently. This age is characterized by accelerated body growth, increasing strength and, at the same time, poorer mobility coordination. Increasing self-esteem often leads to exhibition at high-risk performances and activities. Combined with overestimation of one's own strength, such situations very often lead to injuries (Grivna 2003, Škodáček 2003). As regards the months of the year, injuries peaked in March. On the contrary, the minimum was observed in May, which is quite surprising taking into account the starting fine weather inviting to outdoor activities. Also surprisingly, no increased injury rate was found in September, a month which is generally regarded as hazardous in view of the reduced children's attention after coming back to school from holidays. Czech

School Inspectorate statistics report January and November as the injury rate peak months in the 2005/2006 school year. The minimum injury rate was recorded in June 2006 by the Czech School Inspectorate, which is consistent with the present research, where June was identified as the third least hazardous month (following May and December) (Učitel'ské noviny 2010).

Like with home injuries, the first medical treatment of school injuries was largely provided by the child's general practitioner. Most often, the child was treated and invited for a next visit. Five percent children had to be hospitalised and all of them were subjected to a single surgical procedure. The factors contributing to the occurrence of the injury were largely not specified. Inadequate adult supervision was demonstrated for 9% children. The school environment is specific in some aspects. Preschool and school age children spend the majority of time in collective facilities. Although it is beyond teachers' practical capabilities to keep an eye on all children, teachers' role in school injury prevention is irreplaceable (Grivna 2003).

The most frequent types of injury include falls, often associated with slipping or tripping, which can result in collisions with furniture or the like. Knock-down is also frequent, either intentional (fight, tripping-up) or unintentional (sporting activity, game). Six percent injuries were classed as intentional. Suspected bullying, however, was not proved. Intentional injuries often result from one child's violence against another child. Such injuries occur at places which teachers' supervision does not reach, in chaotic situations or at places of pupils' accumulation. Demonstrably more intentional injuries are both caused and suffered by boys, who are more prone to solve conflicts by violent behaviour, exhibit more physical activity, move faster, and are less attentive (Marádová 2003, Skácelík 2006).

As regards the injury types, distortions and fractures prevail, often arising from children's sporting activities. Severe injuries in the school environment are not very frequent, which, however, does not mean that they never occur. Upper and lower limbs are injured most frequently, especially in the gymnasium or on the playground during physical education or other sporting activities. Such injuries can be

classified both as schools injuries and as sports injuries. As supported by the 2005/2006 school injury statistics, one-half of school injuries happen during physical education lessons. During that period, the number of injuries was the same for boys and girls, although statistics of the causes of injuries bears out the traditional finding that boys are less disciplined and less cautious than girls. This conclusion is also supported by our data. It is an important finding (although not very surprising really) that many injuries arising during sporting activities at school are due the pupils' poorer physical fitness and their clumsiness (Učitel'ské noviny 2010).

Children also suffer injuries frequently while running about or playing during breaks, when supervision by adults is reduced and children are more physically active than during lessons. Energy accumulated during the passive lessons is ventilated during breaks. Many specialists recommend that as a preventive measure, children should be given sufficient space for active ventilation of their excess energy during breaks, best outdoors, e.g. through semi-organized sporting activity. In this targeted manner the hazard of injuries can be suitably reduced and, at the same time, aggressive behaviour of some children can be minimized (Marádová 2003).

The objects immediately responsible for the injuries mainly included surfaces, followed by sporting equipment and furniture. School injury prevention consists of several aspects, a safe environment in the school being one of them. Furniture, teaching devices and all equipment should be made of resistant and harmless materials, should be safe yet interesting for children and should match the children's age.

CONCLUSION

It was the aim of this study, accomplished by engaging general practitioners for children and adolescents within the South-Bohemian administrative region, to map child injuries in the home and school environments. This study was based on the collected 220 questionnaires describing injuries in the home setting and 87 questionnaires describing injuries in the school setting. As the outcome of the study, the places, mechanisms, types, causes, activities and other factors that are most frequently involved in the occurrence of injuries of children and adolescents in the above environments were identified. The sample examined did not exhibit any appreciable deviations as regards the causes, types, circumstances or other factors examined. In the home environment, most injuries were recorded in the 0–3 age category, and boys were involved more frequently than girls. Inadequate adult supervision was a frequent cause of injuries. Children suffered injuries most frequently while playing in the garden or in the kitchen. Falls resulting in open wounds or bruises, especially on the upper limbs, predominated. Mere 20% households were equipped with safety devices (protectors). As regards injuries at school, boys and girls were involved in nearly identical proportions.

Injuries were most frequent in the 11–14 age group for boys as well as girls. As far as the injury mechanism is concerned, impacts and falls causing mainly bruises and distortions of the upper and lower limbs predominated. The majority of injuries occurred during sporting activities within lessons. Objects that were the immediate causes of injuries mainly included surfaces and sporting equipment. Thus, many injuries can be categorized as school injuries and sports injuries simultaneously.

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