

# Injuries to Primary School Pupils and Secondary School Students during Physical Education Classes and in their Leisure Time

Mateja Videmšek<sup>1</sup>, Damir Karpljuk<sup>1</sup>, Suzana Mlinar<sup>2</sup>, Maja Meško<sup>3</sup> and Jože Štihec<sup>1</sup>

<sup>1</sup> Faculty of Sport, Ljubljana, Slovenia

<sup>2</sup> College of Health Studies, Ljubljana University, Ljubljana, Slovenia

<sup>3</sup> Ministry of Transport, Directorate of Civil Aviation, Ljubljana, Slovenia

## ABSTRACT

*The study aimed to establish the frequency of injuries in primary and secondary schools during leisure time and physical education classes in school as well as in group and individual sports. The sample included 2842 pupils from nine primary schools and 1235 students from five secondary schools in Slovenia. The data were processed with the SPSS statistical software package and the frequencies and Crosstabs were calculated. The results showed that substantially more pupils and students were injured in their leisure time than during physical education classes. Girls were more frequently injured in group and individual sports practiced during physical education classes and in individual sports practiced in their leisure time, whereas boys suffered more injuries in group sports practiced in their leisure time. As regards group sports, pupils and students were most frequently injured while playing football in their leisure time whereas, during physical education classes, they suffered most injuries in volleyball, followed closely by basketball and football; as regards individual sports, pupils and students were most frequently injured while cycling and rollerblading in their leisure time, whereas during physical education classes they suffered most injuries in athletics.*

**Key words:** injuries, physical education, leisure time, individual sports, group sports, primary school pupils, secondary school students, gender

## Introduction

Physical education is a continual process of broadening knowledge and developing abilities and personal qualities and is also an important way of developing one's personality and relationships with other individuals<sup>1</sup>. Teachers must strive to contribute to a youngster's balanced development and relaxation as well as to compensate for the negative effects of several sedentary hours at a desk by attaining selected objectives, introducing variegated contents and applying different work methods<sup>2-4</sup>. In physical education, school work is specific and entails a risk of injuries sustained by pupils and students during the pedagogical process<sup>4,5</sup>. In most other subjects within the educational process the probability of injuries is relatively low or negligible and, as a rule, not related to the contents of instruction. Certain injuries can arise during practical lessons, especially in secondary and vocational

schools<sup>6</sup>. Knight, Vernon, Fines, and Dean<sup>7</sup> established that 20 percent of all (school) injuries in children and adolescents, aged between 5 and 18, are also sustained outside of class hours at the school location.

Children can suffer an injury during school physical education classes, in clubs, in associations providing various sport activities under expert guidance as well as in their leisure time<sup>8</sup>. Abernethy, MacAuley, McNally, and McCann<sup>9</sup> reported the results of their study showing that during physical education classes children and adolescents receive 20 percent of bodily injuries, during organised sport activity 62 percent and during unorganised sport activity or one without expert guidance 18 percent. In his study, Hergenroeder<sup>10</sup> found that injuries sustained by children and adolescents during an unorganised sport activity account for 40 percent.

According to physicians, injuries sustained during physical education classes are generally not very serious. Miller and Spicer<sup>11</sup> reported that one-quarter of injuries sustained during physical education classes are serious (fractures, dislocations, brain injuries etc.) while the remaining three-quarters are not that serious (sprains, strains, wounds etc.). Knight, Vernon, Fines, and Dean<sup>7</sup> established that injuries suffered during physical education classes are more common at the beginning of the school year, in the morning.

Some researchers<sup>12,13</sup> have conducted longitudinal studies of the frequency of injuries during physical education classes over a period of four years and established that the number of injuries increases with each year. Helms<sup>14</sup> reported that, in 1980, 3 to 11 percent of pupils and students were injured during physical education classes and that, after 15 years, the figure had soared to 22 percent. Hergenroeder<sup>10</sup> also corroborates that the number of injuries sustained by children and adolescents during sport activities is constantly rising. One could say that the trend has turned into an epidemic; in the USA, as many as 3 million injuries inflicted on children and adolescents during sport activities are recorded each year<sup>10</sup>. In a more recent study, Linakis, Amanullah, and Mello<sup>15</sup> found that in the US schools nearly 4 million children and adolescents are injured each year. This is understandable since, according to the authors, more than 55 million children in the USA spend about one-quarter of their day at school.

In the countries of former Yugoslavia some longitudinal studies were conducted using a sample of secondary school population<sup>4,16,17</sup> and these studies also established growth in the number of injuries suffered during physical education classes. In her comprehensive study, Erčulj<sup>4</sup> investigated 1779 pupils from different, randomly selected primary schools in Ljubljana and made a record of the injuries sustained during physical education classes in the 2002/2003 school year. The results showed that as much as one-third of pupils were injured at least once in the said year. There were more schoolboys injured than schoolgirls; nevertheless, gender did not statistically significantly influence the type and place of injury during physical education classes. Erčulj<sup>4</sup> found that age is statistically significantly related with the number and type of injury but not with the place of injury. She established that the age at which the risk of injury is the highest is between 10 and 13 years. At this age the number of serious injuries (fractures and dislocations) is the highest.

Previous research showed<sup>18</sup> that in 40 percent of cases the reason for visiting emergency departments by children aged between 5 to 14 years is an injury sustained during a sport activity. Children are most susceptible to injuries inflicted on those parts of the body which are in the most intensive growth phase, such as for example the ends of long bones which have not yet fully ossified. The most frequent injuries include bone fractures; about 15 percent of all bone fractures are suffered in childhood. Fractures are twice more common with boys

than with girls. With boys, fractures occur most frequently at the age of 14 to 16, while girls are exposed to the highest risk between 11 and 13 years. Some experts argue that the most frequent injuries are a consequence of overburdening. Not so rarely, already young children are subject to narrow specialisation and too frequent tiring trainings<sup>18</sup>.

Sport injuries can be classified in many ways, however, the most common division is that of internal, i.e. deriving from the athlete, and external, i.e. deriving from the environment<sup>1,19</sup>. A good knowledge of the factors or causes of sport injuries improves the possibility of preventing them. The external causes of sport injuries<sup>19</sup> include: another person, equipment, climate and atmosphere conditions, inadequate safety measures, terrain and coincidence, whereas the internal causes include: fatigue, over-training, the athlete's morphology, functional status, overestimation of one's psychophysical abilities (especially young athletes), the athlete's psychological state and other causes (unfamiliarity with the terrain, effect of medications or doping etc.).

Given that this is a very topical and pressing issue, we aimed to establish the frequency of injuries in pupils and secondary school students in their leisure time and during physical education classes in school, in group and individual sports as well as by gender.

## Methods

### *Participants*

The sample included 2842 pupils from nine primary schools and 1235 students from five secondary schools in Slovenia. The pupils and students were 7 to 19 years old. The sample consisted of 1637 (40.2%) schoolboys and 2440 (59.8%) schoolgirls.

### *Instruments*

The study was based on the 'Sport Injuries in Primary and Secondary Schools' inventory which was designed within the targeted 'Prevention of Sport Injuries in the Republic of Slovenia' research project<sup>20</sup>. The inventory included the following variables and/or sets of variables: school, gender, age, weekly number of physical education classes in school and outside school, frequency of injuries in group and individual sports.

### *Procedures*

The data were processed with the SPSS 15.0 (Statistical Package for the Social Sciences) software package. Frequencies and Crosstabs were calculated. The probability of a relationship between the variables was tested by the contingency coefficient at a 5% risk level.

## Results

The secondary school students who participated in our study attend three physical education classes *per* week according to the applicable syllabus. The study re-

**TABLE 1**  
FREQUENCY OF PRACTICING SPORT IN LEISURE TIME, BY GENDER

Weekly practice of sport	Fr	%	Fr	%	Fr	%
	M and F	M and F	Male	Male	Female	Female
Zero	460	11.3	188	11.5	272	16.6
Once	521	12.8	117	7.1	404	25.9
Twice	908	22.3	277	16.9	631	19.7
3 times	767	18.8	287	17.5	480	10.2
4 times	490	12.0	241	14.7	249	8.4
5 times	474	11.6	269	16.4	205	3.2
6 times	165	4.0	86	5.4	79	4.9
7 times	292	7.2	172	10.5	120	11.1
Total	4077	100.0	1637	100.0	2440	100.0
		Value		Statistical significance		
Contingency coefficient		0.231		0.000		

Legend: Fr – frequency; % – percentage, M – male, F – female

sults showed that, besides physical education in school, most pupils and students also practice sport in their leisure time, as shown in Table 1.

In their leisure time, only 11.3 percent of the study subjects do not engage in a sport activity (Table 1). Twice-weekly practicing of sport was reported by 22.3 percent of the subjects, followed by three times weekly (18.8%) and once weekly (12.8%). The contingency coefficient ( $p=0.000$ ) shows that boys engage in sport in their leisure time statistically significantly more than girls.

**TABLE 2**  
FREQUENCY OF PRACTICING SPORT IN LEISURE TIME, BY SCHOOL

Weekly practice of sport	Primary school		Secondary school		Total	
	Fr	%	Fr	%	Fr	%
Zero	329	11.6	131	10.6	460	11.3
Once	290	10.2	231	18.7	521	12.8
Twice	585	20.6	323	26.2	908	22.3
3 times	548	19.3	219	17.7	767	18.8
4 times	365	12.8	125	10.1	490	12.0
5 times	361	12.7	113	9.1	474	11.6
6 times	129	4.5	36	2.9	165	4.0
7 times	235	8.3	57	4.6	292	7.2
Total	2842	100	1235	100	4077	100
		Value		Statistical significance		
Contingency coefficient		0.154		0.000		

Legend: Fr – frequency; % – percentage

There are more non-active pupils and students among girls (no less than 16.6%) than among boys (11.5%), whereas as many as 31.1 percent of boys and only 11.6 percent of girls engage in sport in their leisure time four to five times a week (Table 1).

Table 2 shows the sport activity of children and adolescents in their leisure time, regardless of whether they are primary school pupils or secondary school students.

In their leisure time, 11.6 percent of pupils and 10.6 percent of students are physically completely inactive. In

**TABLE 3**  
INJURIES SUSTAINED DURING SPORT ACTIVITIES IN LEISURE TIME AND DURING PHYSICAL EDUCATION CLASSES, BY GENDER

Number of injuries	Leisure time						Physical education						
	Total		Boys		Girls		Total		Boys		Girls		
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%	
Zero	2731	67.0	1066	65.1	1665	68.3	3496	85.7	1417	86.6	2079	85.2	
Once	729	17.9	303	18.5	426	17.5	406	10.0	155	9.5	251	10.4	
Twice	311	7.6	124	7.6	187	7.7	108	2.6	44	2.7	64	2.6	
3 times	154	3.8	68	4.2	86	3.5	33	0.8	10	0.6	23	0.9	
4 times	54	1.3	29	1.8	25	1.02	12	0.3	3	0.2	9	0.4	
5 times	52	1.3	29	1.8	23	0.9	14	0.3	3	0.2	11	0.5	
6 times	7	0.2	0	0	7	7	3	0.1	1	0.1	2	0.1	
7 times	7	0.2	2	0.1	5	5	1	0	1	0.1	0	0	
8 times	8	0.2	4	0	4	0.2	0	0	0	0	0	0	
9 times	24	0.6	12	0	12	0.5	0	0	0	0	0	0	
10 times	0	0	0	0	0	0	4	0.1	3	0.2	1	0.04	
Total	4077	100	1637	100	2440	100	4077	100	1637	100	2440	100	
		Leisure time				Physical education							
Contingency coefficient		Value		Statistical significance		Value		Statistical significance					
		0.068		0.027		0.047		0.344					

Legend: Fr – frequency; % – percentage

leisure time, pupils most frequently reported the twice-weekly practicing of sport (20.6%), followed by three times a week (19.3%) and four times a week (12.8%). Most of the students are physically active in their leisure time twice a week (26.2%), followed by once a week (18.7%) and three times a week (17.7%).

Table 3 shows the number and share of pupils and students injured during sport activities in their leisure time and during physical education classes, by gender.

It was established (Table 3) that more surveyed subjects were injured in their leisure time (33%) than during physical education classes (14.3%). As much as 67 percent of the subjects sustained no injury whatsoever in their leisure time, followed by one injury (17.9%), two injuries (7.6%) and three injuries (3.8%). During physical education classes, 85.7 percent of the subjects sustained no injury, followed by one injury (10.0%) and two injuries (2.6%).

Table 3 shows that in their leisure time, more boys were injured (34.9%) than girls (31.8%), while the percentage of injuries suffered during physical education classes was slightly higher with girls (14.8%) than with boys (13.4%). The contingency coefficient shows that, in leisure time, injuries are statistically significantly more frequent with boys than with girls ( $p=0.027$ ), whereas during physical education classes this difference is not statistically significant ( $p=0.344$ ).

Table 4 shows the number and share of pupils and students injured in their leisure time and during physical education classes, by school (primary or secondary).

Table 4 shows that both the pupils and the students sustained more injuries in their leisure time than during physical education classes. The contingency coefficient

( $p=0.000$ ) shows that, in their leisure time, statistically significantly more pupils (35.5%) were injured than students (27.4%). Likewise, statistically significantly ( $p=0.000$ ) more pupils (16%) sustained injuries during physical education classes than students (10.2%) (Table 4).

Table 5 shows the number of injuries sustained by boys and girls in group sports in leisure time and during physical education classes.

Table 5 shows that up to 1017 injuries (64.4% of the total) in group sports were sustained in leisure time and 565 injuries (35.6%) during physical education classes.

In group sports, the highest number of injuries was recorded in football with 451 injuries (28.5%), followed by basketball with 419 injuries (26.5%) and volleyball with 301 injuries (19%).

In leisure time, the majority of injuries sustained in group sports were recorded in football (32.6%), followed by basketball (28.3%) and volleyball (16.2%), whereas during physical education classes the majority of injuries sustained in group sports were recorded in volleyball (24.1%), followed by basketball (23.2%), ball games (22.1%) and football (21.1%). During physical education classes and in leisure time the lowest number of injuries was recorded in handball, 9.6 percent and 11.2 percent of the total, respectively.

In group sports practiced during physical education classes, girls were injured more frequently than boys, while in leisure time the situation was the opposite. Volleyball and ball games are on top of the ladder: girls were statistically significantly more frequently injured than boys, both in their leisure time and during physical education classes. As expected, boys sustained substantially more injuries while playing football than girls (Table 5).

**TABLE 4**  
INJURIES SUSTAINED DURING SPORT ACTIVITIES IN LEISURE TIME AND DURING PHYSICAL EDUCATION CLASSES, BY SCHOOL

Number of injuries	Primary school				Secondary school			
	Leisure time		Physical education		Leisure time		Physical education	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Zero	1834	64.5	2387	84.0	897	72.6	1109	89.8
Once	550	19.4	318	11.2	179	14.5	88	7.1
Twice	234	8.2	85	3.0	77	6.2	23	1.9
3 times	106	3.7	24	0.8	48	3.9	9	0.7
4 times	35	1.2	7	0.2	19	1.5	5	0.4
5 times	42	1.5	13	0.5	10	0.8	1	0.1
6 times	5	0.2	3	0.1	2	0.2	0	0
7 times	6	0.2	1	0.0	1	0.1	0	0
8 times	7	0.2	0	0	1	0.1	0	0
9 times	23	0.8	0	0	1	0.1	0	0
10 times	0	0	4	0.1	0	0	0	0
Total	2842	100.0	2842	100.0	1235	100.0	1235	100.0
Contingency coefficient	Leisure time				Physical education			
	Value		Statistical significance		Value		Statistical significance	
	0.096		0.000		0.085		0.000	

**TABLE 5**  
INJURIES OF BOYS AND GIRLS IN GROUP SPORTS IN LEISURE TIME AND DURING PHYSICAL EDUCATION CLASSES

Group sports	Leisure time						Physical education						
	Total	Total in LT		Gender (Fr)		Contingency coefficient		Total in PE		Gender (Fr)		Contingency coefficient	
	Fr of injuries	Fr	%	M	F	Value	Sig.	Fr	%	M	F	Value	Sig.
Basketball	419	288	28.3	174	114	0.113	0.000	131	23.2	46	85	0.019	0.232
Volleyball	301	165	16.2	36	129	0.077	0.000	136	24.1	21	115	0.093	0.000
Handball	168	114	11.2	25	89	0.063	0.000	54	9.6	24	30	0.010	0.517
Football	451	332	32.6	263	69	0.231	0.000	119	21.1	99	20	0.151	0.000
Ball games	243	118	11.6	36	82	0.034	0.030	125	22.1	35	90	0.044	0.005
Total	1582	1017	100	534	483			565	100	225	340		

Legend: Fr – frequency; % – percentage; M – male; F – female; LT – leisure time; PE – physical education; Sig. – statistical significance

Table 6 shows injuries sustained in individual group sports in leisure time and during physical education classes by school (primary and secondary school).

In their leisure time, male and female pupils statistically significantly more frequently sustained injuries than male and female students in volleyball, handball and football, whereas during physical education classes the pupils suffered statistically significantly more injuries than the students in all sports except basketball (Table 6).

Table 7 shows injuries of pupils and students injured in individual sports in leisure time and during physical education classes, by gender.

Table 7 reveals the following: 1759 injuries (84% of the total) in individual sports occurred in leisure time and 339 (16%) during physical education classes. Both during physical education classes and in leisure time, more girls were injured in individual sports than boys. In individual sports, the highest number of injuries was recorded in cycling – 264 injuries (12.4%) and in rollerblading – 254 injuries (12%). As regards leisure time, the majority of injuries sustained in individual sports were reported in cycling (14.4%) and rollerblading (13.8%), followed by Alpine skiing (8.6%); whereas during physical education classes the majority of injuries sustained in

individual sports were reported in athletics (27.7%) and gymnastics (13%).

### Discussion

The study was made on a sample of 4077 pupils and students aged between 7 and 18 who attended physical education classes in line with the applicable syllabuses for primary and secondary schools. The vast majority of pupils (88.4%) and students (89.4%) also engage in sport activities in their leisure time; girls less frequently than boys. Jazbinšek<sup>21</sup> studied a sample of secondary school students aged between 15 and 19 and supported the finding that boys are more active in their leisure time than girls.

We found that more children and adolescents were injured in their leisure time than during physical education classes in individual and group sports at both primary and secondary schools. During physical education classes, 14.3 percent of pupils and students sustained at least one injury *per year*. In view of the results of Erčulj<sup>4</sup>, who investigated the injuries suffered by primary school pupils in the Ljubljana region, the results of injuries suffered during physical education classes are relatively en-

**TABLE 6**  
INJURIES IN INDIVIDUAL GROUP SPORTS, BY SCHOOL

Group sports	Leisure time					Physical education				
	Primary school	Secondary school	Total	Contingency coefficient		Primary school	Secondary school	Total	Contingency coefficient	
	Number of injuries	Number of injuries		Value	Sig.	Number of injuries	Number of injuries		Value	Sig.
Basketball	208	80	288	0.015	0.335	92	39	131	0.002	0.895
Volleyball	95	70	165	0.054	0.001	79	57	136	0.047	0.003
Handball	66	48	114	0.044	0.005	46	8	54	0.039	0.013
Football	250	82	332	0.036	0.021	94	25	119	0.035	0.025
Ball games	73	45	118	0.029	0.060	100	25	125	0.040	0.011
Total	692	325	1017			411	154	565		

Legend: Sig. – statistical significance

**TABLE 7**  
INJURIES IN INDIVIDUAL SPORTS BY GENDER

Individual sports	Leisure time						Physical education						
	Total	Total in LT		Gender (Fr)		Contingency coefficient		Total in PE		Gender (Fr)		Contingency coefficient	
	Fr of Injuries	Fr	%	M	F	Value	Sig.	FR	%	M	F	Value	Sig.
Athletics	227	133	7.6	40	93	0.038	0.016	94	27.7	16	78	0.072	0.000
Gymnastics	142	98	5.6	8	90	0.102	0.000	44	13	7	37	0.052	0.001
Dance	140	124	7	10	114	0.115	0.000	16	4.7	3	13	0.027	0.080
Aerobics	31	17	0.9	1	16	0.045	0.004	14	4	4	10	0.014	0.376
Fitness	45	33	1.9	19	14	0.032	0.040	12	3.5	3	9	0.017	0.284
Swimming	77	67	3.8	20	47	0.027	0.083	10	2.9	4	6	0.000	0.992
Alpine skiing	173	153	8.6	66	87	0.012	0.443	20	5.9	7	13	0.007	0.638
Snow boarding	73	62	3.5	36	26	0.045	0.004	11	3.2	3	8	0.014	0.383
Cross-country skiing	37	24	1.4	7	17	0.017	0.271	13	3.8	5	8	0.002	0.901
Sledding	76	65	3.7	22	43	0.016	0.296	11	3.2	3	8	0.014	0.383
Snow games	97	87	4.9	35	52	0.000	0.988	10	2.9	5	5	0.010	0.525
Skating	78	64	3.6	17	47	0.035	0.025	14	4.1	3	11	0.022	0.152
Roller-skating	31	27	1.5	8	19	0.018	0.263	4	1	2	2	0.006	0.688
Rollerblading	254	243	13.8	25	218	0.113	0.000	11	3.2	4	7	0.004	0.797
Table tennis	21	13	0.7	9	4	0.034	0.032	8	2.4	2	6	0.014	0.382
Badminton	30	22	1.3	6	16	0.019	0.217	8	2.4	2	6	0.014	0.382
Tennis	64	53	3	21	32	0.001	0.937	11	3.2	4	7	0.004	0.797
Cycling	264	254	14.4	112	142	0.021	0.186	10	2.9	6	4	0.020	0.200
Sport climbing	38	34	2	13	21	0.004	0.819	4	1	1	3	0.010	0.536
Hiking	79	69	3.9	17	52	0.041	0.008	10	2.9	4	6	0.000	0.992
Martial arts	121	117	6.7	53	64	0.018	0.249	4	1	2	2	0.006	0.688
Total	2098	1759	100	545	1214			339	100	90	249		

Legend: Fr – frequency; % – percentage; M – male; F – female; LT – leisure time; PE – physical education; Sig. – statistical significance

couraging. Erčulj<sup>4</sup> recorded no less than 32.3 percent of injuries sustained by pupils during physical education classes in the 2002/2003 school year. However, the results of injuries sustained by pupils and students in their leisure time are of greater concern; according to our study no less than 33 percent of them were injured. In his study, Hergenroeder<sup>10</sup> recorded an even higher percentage of injured children and adolescents during unorganised sport activities – as much as 40 percent. In her study of sport activity and injuries of secondary school students during summer holidays, Jazbinšek<sup>21</sup> observed that 4.7 percent of female students and as much as 13.6 percent of male students suffered an injury during sport; she justified this with the fact that male students are more physically active during holidays than their female counterparts.

As regards group sports in leisure time, one-third of all injuries were reported in football (32.6%), followed by basketball (28.3%) and volleyball (16.2%), whereas during physical education classes the majority of injuries were reported in volleyball (24.1%), closely followed by basketball (23.2%) and football (21.1%). A result that

stands out is that the lowest number of injuries was recorded in handball in both leisure time and during physical education classes. As regards individual sports in leisure time, the majority of injuries were reported in cycling (14.4%) and rollerblading (13.8%), whereas during physical education classes the highest values were recorded in athletics (27.7%) and gymnastics (13%). These results concur with the study of Jurak<sup>22</sup> who has found that secondary school students sustain most injuries in football, basketball and cycling. The findings of Jazbinšek<sup>21</sup> are similar: during summer holidays most of male students were injured while playing football (35.6%) and basketball (20.3%), whereas female students sustained most injuries in volleyball (27.8%).

To aid the interpretation of the number of injuries by sport, the share of time dedicated to sport should also be considered as the possibility of sustaining an injury also depends on time. Irrespective of the applicable physical education syllabus, some teachers tend to prioritise some sports (due to material conditions, pupils' and students' interests, different knowledge of specific sports etc.). This could be one of the reasons for the higher number of

injuries sustained in some sports compared to other sports. Children and adolescents practice certain sport activities more frequently than others in their leisure time, too. Jazbinšek<sup>21</sup> found that, during holidays, male students mostly play football and basketball and cycle, while their female counterparts cycle, rollerblade and swim. These are the sports in which the subjects of our study were injured most frequently.

We established that, in their leisure time, more boys were injured than girls, whereas during physical education classes the percentage of injured girls was higher than that of boys. During physical education classes, girls were injured more frequently than boys in both group sports (volleyball, handball and ball games) and individual sports (athletics and gymnastics), whereas in their leisure time they were more frequently injured in individual sports (athletics, gymnastics, dance, aerobics, skating, rollerblading and hiking). During physical education classes boys were statistically significantly more frequently injured in football, while in leisure time the respective sports were basketball, football, fitness, snowboarding and table tennis. In other sports, the differences were not statistically significant. Erčulj<sup>4</sup> established in her study that during physical education classes boys were injured more frequently than girls, which is supported by the fact that boys are more inclined to take risks, more interested in ball games and more willing to take on new challenges than girls<sup>23</sup>. In his study of injuries sustained by children during physical education classes, Helms<sup>14</sup> reported similar results: boys were injured during sport activities more frequently than girls.

Physical education in school is quite specific in terms of work methods, the approach to pupils and students, nature of the teaching process as well as the possibility that the participants in the education process are injured. Physical education teachers and single class teachers strive to systematically, gradually and comprehensively prepare their pupils for more demanding tasks, however it is impossible to completely eliminate the possibility of injuries<sup>24</sup>.

Physical education teachers should teach children and adolescents how to behave in sport activities in their leisure time. They should teach them different preventive measures which reduce the possibility of injuries in various sports (initial warming up, obligatory protective equipment, appropriate footwear etc.). Parents are not appropriately informed about this issue as well, which is demonstrated by the fact that, in their leisure time, children and adolescents often cycle and rollerblade without

wearing helmets and other protective equipment. This is undoubtedly one of the reasons for the high percentage of injuries sustained during cycling and rollerblading.

Another very important factor in the prevention of sport injuries is the professional qualifications of instructors, teachers and coaches leading different sport activities in associations and private organisations or coaching youngsters in clubs. Physicians have established that sport injuries sustained by youngsters are often a consequence of overburdening<sup>25</sup>. It is not so uncommon that already young children are subject to a narrow specialisation and tiring trainings which are by no means beneficial to the child's overall development and often result in injuries<sup>18</sup>. Some children, especially young athletes, often overestimate their abilities and engage in dangerous activities beyond their capabilities, which increases the risk of injuries<sup>26</sup>. On the other hand, another very important cause of injuries is the low physical fitness level of children or their poor motor abilities – movement co-ordination, strength, balance and flexibility. Another factor worth mentioning is the growing disobedience of pupils and students who often fail to follow their teacher's instructions concerning their participation in sport activities and the appropriate sport equipment.

In our opinion, far too many injuries are being sustained in sport activities. Therefore, it is reasonable that more efforts and means should be devoted to the investigation of this issue and/or the research of the causes of injuries. In particular, action should be taken with regard to leisure time sport activities; in general, children and adolescents engage in sports by themselves, without any expert supervision.

The issue of injuries is certainly very topical, as we live in an era when parents seek legal redress for an injury in court. We wish that all those who work with children and adolescents in the field of sport become aware of the importance of preventive action so as to reduce the number of injuries sustained by youngsters. Not only for the sake of legal proceedings which have become quite common in our society but for the sake of the improved safety of our children and adolescents during physical education classes and in all sport activities.

## Acknowledgements

The study was supported by the Slovenian Research Agency and Slovenian Ministry of Education and Sport within the project »The prevention of sport injuries in the Republic of Slovenia« (V5-0233).

## REFERENCES

1. ERČULJ L, Povezanost izbranih dejavnikov z vidika učenca in učitelja s poškodbami pri pouku športne vzgoje pri učencih in učenkah starih od 7–14 let nekaterih ljubljanskih osnovnih šol. Master's thesis. In Slov (Faculty of Sport, Ljubljana, 2003). — 2. OPPERMAN HP, Körpererziehung, 48 (1998) 298. — 3. MOSEBACH U, Körpererziehung, 48 (1998) 254. — 4. ERČULJ L, Šport, 55 (2007) 57. — 5. MIKIĆ B, Psiho motorika (Tuzla University, Faculty of Arts, Tuzla, 2000). — 6. PAPALIA DE,

- WENDKOS S, OLDS S, DUSKIN FELDMAN R, *Otrokov svet* (Educy, Ljubljana, 2003). — 7. KNIGHT S, VERNON DD, FINES RJ, DEAN MJ, *Pediatrics*, 103 (1999) 81. — 8. MOTA J, SANTOS P, GUERRA S, RIBERO JC, DUARTE JA, *American Journal of Human Biology*, 15 (2003) 547. — 9. ABERNETHY L, MACAULEY D, MCNALLY O, MCCANN S, *Injury Prevention*, 9 (2003) 270. — 10. HERGENROEDER AC, *Pediatrics*, 101 (1998) 1057. — 11. MILLER TR, SPICER RS, *American Journal*

- of Public Health, 88 (1998) 413. — 12. WEHMEYER K, HENNEKE TH, ZIMMER K, DE MAREES H, Sport Praxis, 30 (1989) 35. — 13. DE KNOP P, THEEBOOM M, HUTS K, VAN HOECKE J, DE MARTELAER K, European Physical Education Review, 10 (2004) 21. — 14. HELMS PJ, Archives of Diseases in Childhood, 77 (1997) 161. — 15. LINAKIS JG, AMANULLAH S, MELLO MJ, Academic Emergency Medicine, 13 (2007), 567. — 16. JANOŠIK K, Ozljede učenika na satu fizičkog odgoja praćene kroz pet godina. In: Proceedings (I. kongresa ljećnika školske medicine Hrvatske. Split, Trogir, 1972). — 17. ZURKOVIC Z, PETER R, GOLUBOVIC N, Športno-medicinske objave, 10 (1973) 65. — 18. Športne poškodbje pri otrocih narašćajo, Ljubljana: Digitalmedia, accessed 15.10.2007. Available from: URL: <http://www.digitalmedia.si/index.php?id=246>. — 19. VIDMAR J, Športna traumatologija (Faculty of Sport, Ljubljana, 1992). — 20. KARPLJUK D, VIDEMŠEK M, MLINAR S, HADŽIĆ V, DERVIŠEVIĆ E, MEŠKO M, Športne poškodbje v osnovnih in srednjih šolah. In: Proceedings (3rd international congress Prevention and Rehabilitation in Sport, Ljubljana (2007). — 21. JAZBINŠEK N, Preživljanje poćitnic srednješolcev z vidika ukvarjanja s športom. Graduation thesis. In Slov (Faculty of Sport, Ljubljana, 2008). — 22. JURAK G, Preživljanje poletnih poćitnic otrok in mladine z vidika ukvarjanja s športom (Faculty of Sport, Ljubljana, 2003). — 23. TROST SG, PATE RR, SALLIS J, FREDSON PS, TAYLOR WC, AND DOWDA M, Medicine and Science in Sport and Exercise, 34 (2001) 350. — 24. CORBIN C, Journal of Teaching Physical Education, 21 (2002) 128. — 25. ERĆULJ F, SUPEJ M, Journal of strength and conditioning research, 23 (2009) 1029. — 26. HADŽIĆ V, SATLER T, TOPOLE E, JARNOVIĆ Z, BURGER H AND DERVIŠEVIĆ E, Isokinetics and Exercise Science, 17 (2009) 155.

*M. Videmšek*

*Faculty of Sport, Gortanova 22, 1000 Ljubljana, Slovenia  
e-mail: Mateja.Videmsek@fsp.uni-lj.si*

## **OZLJEDE UĆENIKA OSNOVNIH I SREDNJIH ŠKOLA ZA VRIJEME SATOVA TJELESNE KULTURE I U SLOBODNO VRIJEME**

### **SAŽETAK**

Cilj istraživanja bio je utvrditi frekvenciju ozljeda kod ućenika osnovne i srednje škole u slobodno vrijeme i za vrijeme satova tjelesne kulture u školi, kako u grupnim tako i u individualnim sportovima. Uzorak je uključivao 2842 ućenika iz devet osnovnih škola i 1235 ućenika iz pet srednjih škola u Sloveniji. Podaci su obrađeni SPSS statističkim softverskim paketom te su izračunate frekvencije. Rezultati su pokazali da znaćajno više ućenika zadobije ozljede u svoje slobodno vrijeme, nego na satovima tjelesne kulture. Djevojke su češće završavale s ozljedama na satovima tjelesne kulture i u grupnim i u individualnim sportovima te u individualnim sportovima u slobodno vrijeme, dok su dječaci zadobili više ozljeda u grupnim sportovima u slobodno vrijeme. Što se grupnih sportova tiće, ućenici su najčešće ozljede dobivali igrajući nogomet u svoje slobodno vrijeme, dok su najčešće ozljede na satovima tjelesne kulture bile kod igranja odbojke, a zatim košarke i nogometa. S obzirom na individualne sportove, najviše su ozljeda ućenici zadobili vozeći bicikl i rolajući se u svoje slobodno vrijeme, odnosno trenirajući atletiku na satovima tjelesne kulture.