

Martínez-de-Quel-Pérez, Ó.; Sánchez-Moreno, A.; Zamorano-Feijóo, C.; Ayán-Pérez, C. (2019). Epidemiología lesional en actividades escolares y extraescolares en la Comunidad de Madrid (España) / Sport Injuries in School and Extracurricular Activities in the Community of Madrid (Spain). . Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 19 (73) pp. 151-166 [Http://cdeporte.rediris.es/revista/revista73/artprevalencia987.htm](http://cdeporte.rediris.es/revista/revista73/artprevalencia987.htm)
DOI: <http://doi.org/10.15366/rimcafd2019.73.011>

ORIGINAL

SPORT INJURIES IN SCHOOL AND EXTRACURRICULAR ACTIVITIES IN THE COMMUNITY OF MADRID (SPAIN)

EPIDEMIOLOGÍA LESIONAL EN ACTIVIDADES ESCOLARES Y EXTRAESCOLARES EN LA COMUNIDAD DE MADRID (ESPAÑA)

Martínez-de-Quel-Pérez, Ó.¹; Sánchez-Moreno, A.²; Zamorano-Feijóo, C.³;
Ayán-Pérez, C.⁴

¹ Doctor en Ciencias de la Actividad Física y el Deporte; Universidad Complutense de Madrid; Facultad de Educación; Departamento de Didáctica de las Lenguas, Artes y Educación Física (España) odequel@ucm.es

² Graduado en Ciencias de la Actividad Física y el Deporte y en Magisterio de Educación Primaria; Colegio Miramadrid; Departamentos de Extraescolares (España) asmca1990@gmail.com

³ Graduado en Ciencias de la Actividad Física y el Deporte; Colegio Bilingüe Cantín y Gamboa; Departamento de Educación Física (España) carloszamorano-feijoo@gmail.com

⁴ Doctor en Ciencias de la Actividad Física y el Deporte; Universidad de Vigo; Facultad de Ciencias de la Educación y el Deporte; Departamento de Didácticas Especiales; Well-move Research Group (España) cayan@uvigo.es

Spanish-English translator: Ricardo Collazo, ricardo@bonza.es

Clasificación UNESCO / UNESCO code: 3202 Epidemiología / Epidemiology
Clasificación Consejo de Europa / Council of Europe classification: 17. Otras: Epidemiología / Epidemiology

Recibido 1 de marzo de 2017 **Received** March 1, 2017

Aceptado 3 de mayo de 2018 **Accepted** May 3, 2018

ABSTRACT

This study aimed to analyse the epidemiology of sport injuries that occurred during activities performed under teacher supervision (Physical Education, break and extracurricular activities), at high school. A questionnaire regarding sport injuries were administered to 1050 students (mean age 13.9 ± 1.3 years). Out of the 848 sport injuries registered, 319 (172 in boys and 147 in girls) took

place during activities performed under teacher supervision, (0.30 injuries/student). Extracurricular activities were the scenario in which the highest injury rate (0.12) was observed. There was a higher incidence of injury at age 13 and a lower likelihood of injuries occurring in boys (OR = 0.64 (0.49-0.85); $p < 0.05$). Sprains and contusions were the type of injury most frequently observed, especially in areas such as ankles and knees. A total of 27.3% of the injuries reported prevented the students from actively participating in the Physical Education sessions for more than three days.

KEYWORDS: injury, education, sport, teacher, extracurricular activities.

RESUMEN

Este estudio tuvo como objetivo analizar la epidemiología lesional deportiva de las actividades desarrolladas bajo responsabilidad docente (Educación Física, recreo y actividades extraescolares) en centros de Educación Secundaria Obligatoria (ESO). Participaron 1.050 estudiantes (edad media 13,9 \pm 1,3 años) que cumplimentaron un cuestionario sobre lesiones deportivas. De las 848 lesiones registradas en total, 319 (172 en chicos y 147 en chicas) ocurrieron en actividades desarrolladas bajo responsabilidad docente (0,30 lesiones/estudiante). Las actividades extraescolares fueron el ámbito con mayor promedio de lesiones (0,12 por estudiante). Se observó una mayor incidencia lesional a los 13 años y una menor probabilidad de que las lesiones ocurriesen en los chicos (OR = 0,64 (0,49-0,85); $p < 0,05$). Los esguinces y las contusiones fueron las lesiones más frecuentes, especialmente en tobillo y rodilla. Un 27,3% de las lesiones impidieron al alumnado participar activamente en las sesiones de Educación Física durante más de 3 días.

PALABRAS CLAVE: Lesiones, educación, deporte, profesor, actividades extraescolares.

INTRODUCTION

Currently, there has been an increase in the prevalence of sedentary lifestyles, especially among children and adolescents. Therefore, it seems necessary to develop strategies for promoting the performance of physical activity (PA) at early ages (Arriscado, Muros, Zabala and Dalmau, 2014). In this regard, it has been observed that in this population, the most suitable time of day for performing PA takes place during school hours (De Baere, Lefevre, De Martelaer, Philippaerts and Seghers, 2015). Therefore, it seems advisable to develop said strategies at school (Black, Menzel and Bungum, 2015). Indeed, several investigations have observed an increase in the amount of PA performed following the implementation of interventions promoted by an educational institution. These interventions are usually based on increasing the time spent in three types of activities: physical education (PE) (Van Sluijs, McMinn and Griffin, 2007), facilitating PA during recess (Parrish, Okely, Stanley

and Ridgers, 2013), and encouraging participation in extracurricular activities involving PA (Hatfield and Chomitz, 2015).

However, increased PA in children and adolescents also leads to an increased risk of injury (Nauta, Martin-Diener, Martin, Van Mechelen and Verhagen, 2015). Thus, in these three areas in which PA is promoted and carried out under the supervision of an educator, there is a certain incidence of injury that should be considered (Christiansen, Andersen, Ersbøll, Jespersen, Franz and Wedderkopp, 2014; Menckel and Laflamme, 2000; Prange and Kühn, 1990). Consequently, it has been pointed out that schools should perform preventive interventions in this regard (Collard, Chinapaw and Van Mechelen, 2009). These strategies should have as a starting point identification of the risk of sports injury that exists in these settings, as well as the consequences of suffering these types of injuries in the academic life of students. This information can be of great interest for the professional who works in an educational setting, as they can play an important role in preventing school-based sport injuries (Habelt, Hasler, Steinbrück and Majewski, 2011).

In spite of the importance of this issue, scientific evidence regarding the prevention of sport injuries at school at the national level is scarce (Onís, Varona, Gil, Felici and Embid, 2015). Therefore, it seems of interest to develop more research on this subject. Under these circumstances, the aim of this study was to provide information regarding the prevalence and types of injuries suffered by students who attended a mandatory secondary school in the Autonomous Community of Madrid as a result of PA during PE classes, recess or extracurricular activities organised by the school.

METHOD

A cross-sectional retrospective study was conducted.

Sample

In order to design the present research, we considered that the probability of suffering an injury at school is influenced by its location (urban versus rural), size (number of students and PE sessions) and the characteristics of the sport facilities (hazardous versus suitable) (Sosnowska and Kostka, 2003; Grimaud, Piette, Clappier, Deguen and Pommier, 2007). Accordingly, four schools with different characteristics located in the Autonomous Community of Madrid were selected. Two were located in Madrid capital and the other two in smaller municipalities within this region. The number of students enrolled was less than 600 in two schools and more than 1,200 in the other two. As for sports facilities, two centres had an outdoor track, gymnasium and pavilion, one centre also had a swimming pool and a multi-sport track, and another centre had a small gymnasium and a small outdoor track.

All students who were attending mandatory secondary education in these schools during the 2013/2014 academic year were invited to take part in the research. Those students who showed health problems that prevented them

from taking part in PE sessions during that year were excluded from the research.

Instruments

A questionnaire was used to collect retrospective information on the prevalence and characteristics of sports injuries that occurred during the school year. This questionnaire was adapted from a version originally designed by Vaquero and González (2000) and later modified by Gutiérrez-Castañón (2008 and 2014). This questionnaire included questions about the characteristics of the sports injuries suffered by the student during the academic year (type, affected body area, recurrent injury), the moment in which the injury occurred (PE session, recess, extracurricular activities and others), the treatment applied and the number of PE sessions in which active participation was not possible as a result of the injury (1, 2, 3 or more). Questions were then added regarding the type of work that had to be performed by the student during the inactivity period in the PE sessions. In addition, some modifications were made regarding the questions related to the treatment received, because the student was asked to indicate who treated the injury (Annex I). Prior to its administration, a pilot study was carried out in which a group of 45 secondary school students completed the questionnaire on two occasions with 1 week between them. The students were found to understand the questions correctly and to answer them in the same way on both occasions.

Procedures

The questionnaire was administered by two graduates in PA and Sport Sciences to all the student groups in May of the 2013/2014 academic year during final PE sessions. Before the questionnaire was filled, the objective of the study was described to the students and it was explained that the concept of sports injury referred to any accident or physical dysfunction that occurred during the practice of sports, or as a direct consequence of it (Pascual, Pérez and Calvo, 2008). Prior to the performance of the study, informed written consent was requested and obtained from the participants, their respective parents/guardians, and school principals. The study was carried out in compliance with the norms of the Declaration of Helsinki (General Assembly of the World Medical Association, 2014) and following the guidelines of the European Community for Good Clinical Practice (111/3976/88 of July 1990), as well as the Spanish legal framework for clinical research in human beings (Royal Decree 561/1993 on clinical trials).

Statistical analysis

The statistical analysis was performed by means of the SPSS 21 software. Initially, after recording data and eliminating those questionnaires with errors in their completion, the total number of sports injuries that took place in the different settings (PE, recess, extracurricular activities, out of school) were registered, considering the participants' age and sex. The average number of injuries was analysed, taking into account the number of students included in

each group. The ANOVA test was used to determine the differences between age groups, and the Games-Howell post-hoc test was used to determine the differences between groups two to two. Calculation of Odds Ratio (OR) was used to identify the influence of genre on injury risk, and the probability that an injury would take place in one of the four areas analysed, for each sex. The Chi-square statistic was used to determine the existence of significant differences in injury frequency, taking into account sex, age and the analysed area. The description of the injuries (type of injury, anatomical location), as well as the person who administered the treatment, the consequences of the injury regarding the impossibility to take part in PE classes, as well as the work that the student was asked to do during this time, was carried out by calculating the percentage of injuries of each type. The Chi-square statistic was used to determine whether there were significant differences between the frequency of occurrence of these injuries. For the entire analysis, a significance level of $p < 0.05$ was established.

RESULTS

The questionnaire was administered to a total of 1,075 students. Twenty-five (2.3%) were rejected for further analysis due to errors in their completion; thus the final sample was made up of 1,050 students (mean age 13.93 ± 1.3 years; 48% female) The distribution of participants by age and sex was as follows: 12 years: 84 boys and 83 girls; 13 years: 138 boys and 136 girls; 14 years: 124 boys and 116 girls; 15 years: 111 boys and 96 girls; 16 years: 89 boys and 73 girls. A total of 848 sports injuries were recorded (515 in boys and 333 in girls), representing a mean of 0.81 injuries/student. The distribution by area and sex is shown in Table 1. A total of 37.6% of injuries were recorded in activities carried out under the supervision of a teacher (13.9% in PE, 9.2% in recess and 14.5% in extracurricular activities). In the activities performed outside the school, a total of 62.4% injuries were registered.

In this global analysis, significant differences between age groups were observed after using the ANOVA test ($F=3.109$, $p < 0.05$). Games-Howell's post-hoc analysis confirmed that the number of injuries in the 16-year-old group was higher than in the 12- and 13-year-olds ($p < 0.05$). In relation to sex, the OR calculation showed that the risk of injury was higher in boys than in girls (OR 2.39 (1.86-3.08); $p < 0.05$). The analysis showed that 68.7% of the boys and 47.8% of the girls reported having suffered a sport injury during the academic year.

Table 1. Number of sports injuries registered in each area distributed by sex

Area in which the injury occurred	Sex		Total
	Male	Female	
Physical Education	59	59	118
Recess	51	27	78
Extracurricular	62	61	123
Outside the school	343	186	529

The average number of injuries registered during the academic year was reduced to 0.30 injuries/student when only the 319 injuries (172 in boys and 147 in girls) occurring in activities carried out under the supervision of teachers were taken into account. Table 2 shows the average number of sports injuries sustained in the analysed school year during PE sessions, recess and extracurricular activities, taking into account the participants' age. A higher average of sports injuries were observed in extracurricular activities (0.12 per student). Taking these three areas of activity as a whole, the highest injury rate was observed at 13 years of age and the lowest at 16 and 12 years of age. There was no increasing or decreasing evolution of the average number of injuries per student according to age.

When identifying the influence of age on each of the three areas analysed, the Chi-square statistic ($\chi^2 = 19.75$; $p > 0.05$) showed that some cells of the contingency table were overrepresented. The analysis of the codified standardized residuals showed that at the age of 12, the frequency of injuries in recess was higher and in extracurricular activities was lower than expected. At the age of 15, the frequency of injuries in extracurricular activities was higher than expected provided that the distribution had been uniform. In relation to the influence of sex, it was observed that the probability of an injury occurring in activities performed under teacher supervision was lower in boys (OR = 0.64 (0.49-0.85); $p < 0.05$). In percentage terms, when analysing the total of the three areas (PE, recess and extracurricular activities), it was found that girls were injured more frequently than boys (43.4% vs. 33.2%).

Analysing the three areas separately, the probability that a sports injury will occur in PE and in extracurricular activities was found to be higher in girls (OR 0.78 [0.49-1.23] $p < 0.05$ and OR 0.79 [0.50-1.25] $p < 0.05$ respectively). This risk was higher in boys in the case of recess (OR 1.87 [1.10-3.18] $p < 0.05$). The Chi-square test ($\chi^2 = 5.47$; $p > 0.05$) showed that there were no significant gender differences in the frequencies of the three domains analysed separately.

Table 2. Average number of sports injuries according to age and area of sports practice developed under teaching responsibility

Age	Sex		Are in which the injury occurred		
	Male	Female	PE	Recess	Extracurricular
12 years	0.27	0.20	0.09	0.11	0.04
13 years	0.41	0.38	0.14	0.11	0.15
14 years	0.27	0.34	0.13	0.05	0.12
15 years	0.31	0.31	0.11	0.05	0.15
16 years	0.29	0.12	0.07	0.05	0.09
Total	0.32	0.27	0.11	0.07	0.12

The type of sports injury registered and the most frequently injured anatomical areas are shown in Tables 3 and 4. Sprains and bruises were the most frequent injuries, both in general and by area. These injuries accounted for 34.8% and 24.8% of all sports injuries occurring during activities carried out under the

supervision of teachers. In terms of anatomical location of sports injuries recorded in total and by area, the ankle and knee were the most frequently affected body areas with 27% and 17.9% respectively.

Table 3. Types of sports injuries recorded during PE, Recess and Extracurricular Activities

Type of injury	Area in which the injury occurred				% of total injuries
	PE	Recess	Extracurricular	Total	
Sprain	45	28	38	111	34.80%
Concussion	32	20	27	79	24.76%
Muscular strain	12	2	14	28	8.78%
Fracture	5	9	13	27	8.46%
Burns	6	7	10	23	7.21%
Tendonitis	4	3	8	15	4.70%
Dislocation	2	0	7	9	2.82%
Others	12	9	6	27	8.46%
Total	118	78	123	319	100.00%

Table 4. Anatomic location of the sport injuries registered during PE, Recess and Extracurricular activities

Anatomic location of the lesion	Area in which the injury occurred				% of total injuries
	PE	Recess	Extracurricular	Total	
Ankle	33	26	27	86	26.96%
Knee	17	17	23	57	17.87%
Wrist	13	7	11	31	9.72%
Back	16	2	9	27	8.46%
Hand	4	6	14	24	7.52%
Foot	4	6	9	19	5.96%
Head	4	5	3	12	3.76%
Neck	6	0	3	9	2.82%
Shoulder	3	1	2	6	1.88%
Hip	2	1	0	3	0.94%
Other	16	7	22	45	14.11%
Total	118	78	123	319	100.00%

After having suffered the sports injury, the professional who was most frequently sought for care was a doctor (51.1%). In comparison, the teacher (1.88%) and the coach were less likely to be sought for help. It should be noted that a significant number of injuries were treated without seeking for assistance (18.5%), by a relative (10.34%) or by the students themselves (10.34%).

Table 5. Person approached for treatment taking into account the place or area in which the injury occurred

Person approached for treatment	Place or area in which the injury occurred				% of total injuries
	PE	Recess	Extracurricular	Total	
Doctor	56	43	64	163	51.10%
None	27	14	18	59	18.50%
On their own	13	10	10	33	10.34%
Relative	13	6	14	33	10.34%
Coach	0	0	11	11	3.45%
Teacher	4	2	0	6	1.88%
Other	5	3	6	14	4.39%
Total	118	78	123	319	100.00%

Taking into account the area where the injury occurred and the person asked by the students to treat the injury, the Chi-square statistic was calculated ($\chi=26.20$, $p<0.05$). As a result, it was observed that there were some overrepresented boxes in the contingency table. The post-hoc calculation of the codified standardized residuals showed that, in a statistically sound way, the injured person looked for the coach when the injury occurred during extracurricular activities but did not look for the teacher when the injury occurred during PE.

Figure 1 shows the impact of the sports injury on the way in which the students participated in PE sessions. It was observed that 39.6% of the injuries suffered by them did not limit their participation, while 27.3% of the reported injuries meant that they could not actively participate in PE for more than three consecutive sessions.

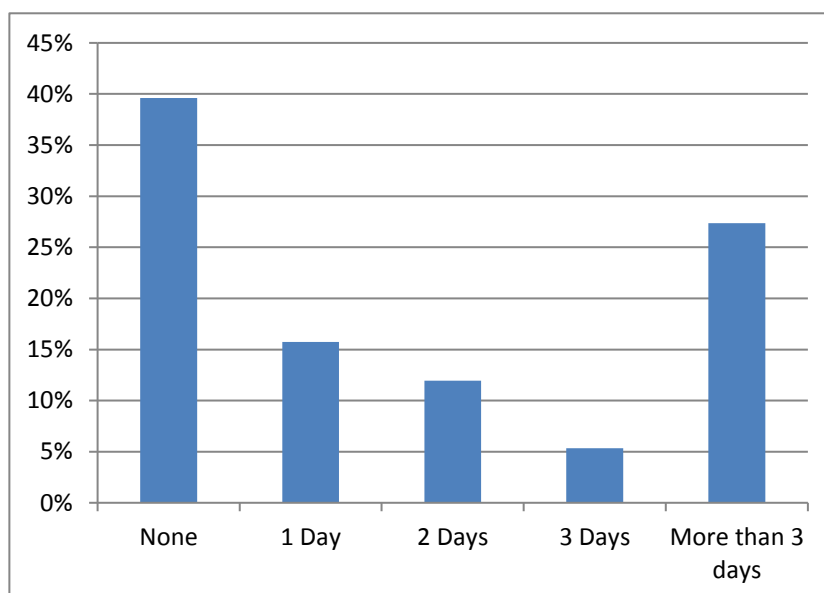


Figure 1. Consequences of sport injuries on PE participation

Regarding the type of work that the students were asked to do when the sports injury prevented them from being actively involved in the PE sessions (Figure 2), observational tasks (52.5% of the cases) and the development of a class diary (24.5%) were the most frequent activities reported. In 12% of the cases, no task was assigned to the students.

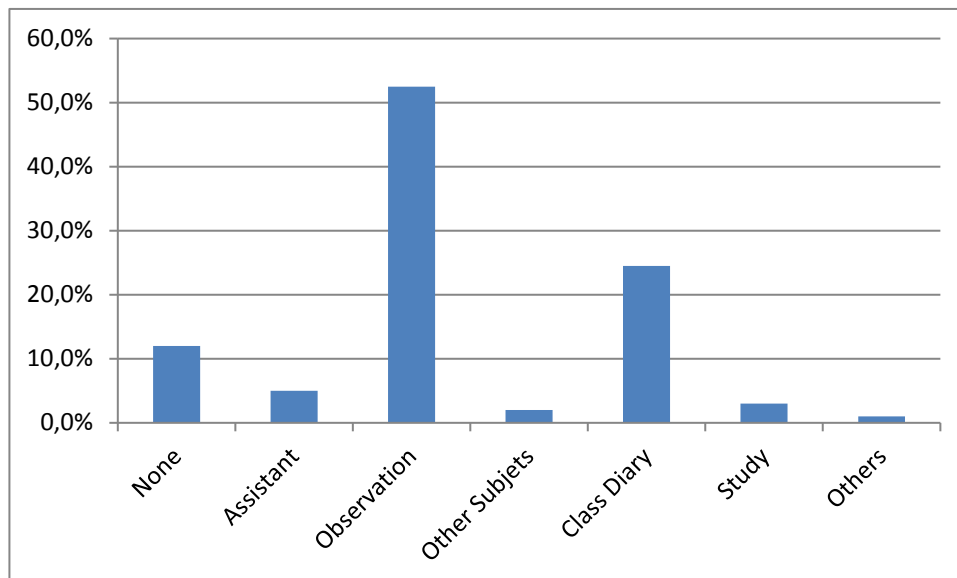


Figure 2. Tasks assigned to the student exempted from active participation in PE as a consequence of suffering a sport injury

DISCUSSION

The purpose of this study was to provide information in relation to the characteristics and types of injuries that occur in the three main areas in which PA is promoted under the supervision of school teachers or educators: PE, recess and extracurricular activities. There is little research carried out in this regard in the national context and it is not without its limitations. For example, research by Vaquero et al. (2000) provided information about the number of injuries observed in an educational centre, but the study sample was small (n=123) and the injuries that occurred during recess were not specifically identified. More recently, Gautier and Martínez (2011) analysed the injuries that occurred in various educational centres, but did not differentiate between sports injuries and accidents, nor did they distinguish the areas in which the injury took place. Finally, Onís et al. (2016) described the number, type, and severity of injuries that occurred during school hours, but only reported information on those that had been treated in the emergency service.

Perhaps the most comprehensive research work to date is the doctoral thesis by Gutiérrez-Castañón (2014), who compared the percentage of injuries occurring during PE with the number of injuries registered in other areas. This author also used a questionnaire in order to recall information, which was administered to a considerably smaller sample than in the present study (637 students in fourth year of mandatory secondary school). However, it should be recognised that a more robust methodology was used in this investigation, since

the PE attendance was objectively controlled, and two key aspects were taken into account. First, the questionnaire was administered on a quarterly basis, thus reducing possible recall bias. Secondly, information was obtained on the number and type of PAs performed by students outside school hours, a variable that may have a direct impact on the possibility of suffering an injury in school.

Therefore, although the results presented here increase and make more complete the existing scientific evidence about school-based PA injuries in our country, it should be borne in mind that they were obtained through a methodological design that was not without its weaknesses. This fact limits the strength, transference and interpretation of the data obtained, which need to be complemented by existing data and future research.

The analysis performed shows that PA practice in schools and in extracurricular activities organised by schools is relatively safe, especially when compared to other areas where PA is not carried out under the supervision of a teacher. These data are consistent with the results observed by Gutiérrez-Castañón, Valbuena-Láiz, Álvarez-Barrio, Cid-Yagüe, Martínez-de-Haro and Muñoz-Blas (2007), who, after recording the number of injuries in 926 students in the first and third year of secondary mandatory school for 1 month, found that of the total of 31 students who had been injured, only 8 suffered the injury during PE practice. This finding could be due to the fact that PA performed in other areas, whether disorganized or practiced in a regulated and competitive manner, has a higher injury rate, which is greater than that resulting from the practice of sports in school (Nauta et al., 2015).

Although when compared with other settings, such as the street or the student's home, the school environment shows a much lower accident rate of injuries (Navascues et al., 2005; Benítez, Soriano and León, 2010), the present study found an injury rate that should be noticed, which is in line with the findings of other studies. For instance, Sundblad, Saartok, Engström and Renström (2005) observed a total of 306 sports injuries reported by a sample of 1,975 children of which 25% (n=77) and 16% (n=48) occurred during PE sessions and recess, respectively. Similarly, Prange and Kühr (1990) reported that of a total of 887 school accidents attended in an emergency service, 53% occurred during sport training sessions and 28% during recess.

There is scientific evidence in the literature suggesting that PE is a major injury risk factor (Carmeli, Azencot, Wertheim and Coleman, 2003; Peltzer and Pengpid, 2015) that may even account for up to a quarter of all school accidents (Nelson, Alhajj, Yard, Comstock and McKenzie, 2009). However, the incidence of injury resulting from the PE practice found in this study can be considered to be small. Possible reasons for this low incidence could be the biweekly frequency of the sessions, the fact that the classes are held under the supervision of professionals with specific training to teach the subject and the controlled intensity under which PE sessions are usually held in secondary mandatory school (Greier, Heinzle, Nepo, Ratschiller, Gafriller and Riechelmann, 2015; Christiansen et al., 2014).

In contrast to what was observed in PE, a high injury rate was found in extracurricular activities carried out under the authority of the school. In this line, in one of the few national studies (carried out with 401 students of secondary mandatory school who were followed during a trimester) that provided information on the subject, it was found that extracurricular activities was the area that showed the greatest number of injuries, which was much higher than that observed in PE and as a result of the practice of competitive sport (Gutiérrez-Castañón, 2008). At an international level, Prange and Khur (1990) found that 3% of school accidents occurred during this type of activity, while Sun, Yu, Wong, Zhang, Fan and Guo (2006) found a much higher percentage (22.8%). In this research, school was the environment in which the highest number of injuries took place, as in the present study.

This high number of injuries could be due to two reasons. First, schools often organise extracurricular activities based on alternative sports activities (e.g., winter sport week, activities in the natural environment) that could present a high risk of injury. On the other hand, it is also possible that students may have been injured during sports activities organised by schools outside school hours (e.g., sports initiation, inter or intra-centre competitions). The high percentage of injuries found in this study makes it advisable to ensure effective supervision when it comes to organizing extracurricular activities, as previously suggested (Pressley, Barlow, Durkin, Jacko, Domínguez and Johnson, 2005).

Two factors that are associated with injury epidemiology are age and sex. In this regard, some authors have reported that both factors do not have a significant influence on the frequency of injuries recorded in teaching and classroom facilities (Sunblad et al., 2005; Vaquero and González, 2000). This study identified a higher injury rate at 13 years of age for both sexes, when the injuries sustained during PE, recess and extracurricular activities were analysed as a whole. These data are in line with those reported by Sosnowska and Kostka (2003), who recorded a peak in the incidence of injury in schools at the same age. In addition, when sex and age have been studied together, a higher frequency of sports injuries has been found at 12 years of age in general, with more injuries occurring between 13-14 years in girls and between 15-16 years in boys (Abernethy and MacAuley, 2003).

Another interesting finding of this research is the fact that the relative risk of sports injuries occurring in activities carried out under the supervision of teachers was lower in boys, which is in line with what was reported by other authors. Of interest, Nauta et al. (2014) focused their analysis on school sports practice and observed a higher injury rate in girls. Similarly, Verhagen, Collard, Paw and Van Mechelen (2009) also found a higher probability of sports accidents among girls, when analysing the total number of injuries occurring during an academic year in school children aged 10-12 years. Factors such as the lower level of physical fitness or sporting ability of the girls could provide an explanation for these findings. Also, of note, is the fact that the risk of a sports injury occurring during PE practice was higher for girls. This finding is consistent with those of other authors who have observed a higher percentage of injuries during PE sessions in the female gender (Sunbland et al., 2005; Videmsek, Karpiljuk, Mlinar, Meško and Štihec, 2010).

In relation to the type and location of injuries, sprains were the most frequent injuries reported and the lower extremities were the most affected anatomical location, as has been observed in similar research (Sunblad et al., 2005; Carmeli et al., 2003; Collard, Chinapaw and Van Mechelen, 2009). This pattern, which, was also evident during PE, is also consistent with the findings of previous investigations published on the subject (Gutiérrez-Castañón, 2014; Nelson et al., 2009).

There is generally little information available on the consequences of sports injuries occurring in activities conducted under the supervision of teachers, or on the participation of injured students in PE sessions. In this regard, Gutiérrez-Castañón (2014) noted that injuries occurring outside PE meant a longer period of inactivity. On the contrary, the students who were injured during PE practice did not tend to be absent for more than 1 day. The results of the present research indicated that no injury resulted in exemption from PE, but that a considerable percentage of these injuries (27%) resulted in students not being able to participate actively in three or more PE sessions consecutively. This, coupled with the fact that up to 12% of students were not assigned any task during these sessions, is an interesting finding in the field of teaching practice. It has been confirmed that the academic consequences of sports injuries suffered in activities carried out under the responsibility of teachers are considerable. This is because the injury not only limits the acquisition of content by the students in a practical way, but also poses the possibility of reinforcing knowledge through alternative tasks related to the subject matter taught.

Finally, teachers should be informed of the importance of identifying the activities in which their students are prone to be injured and the characteristics of those activities. It is equally important knowing how to act appropriately in this regard (Barrios, Jones and Gallagher, 2007). The results of this study suggest that the teacher is not the first person to be called upon in the case of injuries occurring under his/her supervision, which is in line with what has been reported in other studies (Sunbland et al., 2005). Although generally students do not receive medical treatment in the school (Onís et al., 2015), these findings reinforce the previously observed need for teachers to acquire basic skills that will allow them to act with solvency in this type of situation (Abernethy, MacAuley, McNally and McCann, 2003).

Despite the originality of this research and the usefulness of its findings in developing prevention strategies, there are certain methodological weaknesses that limit their generalization and applicability. This is mainly due to the fact that a questionnaire was used to record the number of injuries produced, a methodology frequently used in similar studies (Gutiérrez-Castañón, 2014). However, the reminder time requested was 1 year, so the existence of a bias resulting from the inability to effectively recall all the information requested by the students cannot be ruled out. In addition, the sample population of this work was made up exclusively of students from the Community of Madrid, so the results might not be directly extrapolated to educational centres in other Autonomous Communities. Such centres may have other organised sports practices depending on factors such as school hours, weather and the types of

organised extracurricular activities that are practised. Finally, it should be recognized that if a greater number of schools (and therefore students) were included in the analysis, the results would benefit from greater statistical power. Thus, the conclusions drawn would be more robust.

In closing, the results of this study indicate that sports injuries sustained in activities carried out under teachersupervision occur to a lesser extent when compared to those observed in other areas in which students engage in PA. The risk of this type of injury occurring in the educational setting is lower in boys and the injury rate is higher at 13 years of age. The most common sports injuries are sprains and bruises, especially of the ankle and knee, and it should be noted that their severity may in some cases limit the active participation of students in three or more PE sessions. Prevention strategies should pay special attention in the development of extracurricular activities, as they present a higher percentage of injuries compared to PE and recess.

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