

**Research Article**

# Physical Fights Involvement in School Setting and Adolescents' Behaviours: Highlights from Health Behaviour in School-Aged Children (HBSC/WHO) - Fights in School Setting and Adolescent's Behaviours

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**Key-Findings**

1. The occurrence of physical fights in school has a high prevalence (61.1%). Interventions in school context and active support from teachers and school staff are already taking place, however a more intense action is needed.
2. Physical fights involvement is different between genders and school grades (considered as a proxy of age), therefore public policies must take into consideration what is safety perception if one is a boy or a girl, a younger or older adolescent, and also how the perception of lack of safety affects them.
3. Youngest students from 6<sup>th</sup> grade reported more physical fights involvement in school context; suggesting that later on either peer to peer violence fades or it takes more internalised forms, whose effects must be considered.
4. Girls had more risk behaviours associated with physical fights occurrence than boys.
5. For boys, carrying weapons decreases the probability of physical fights occurrence in school context. This happens because if boys tend to react through physical fights involvement when they perceive an unsafe environment, carrying weapons can give them a greater sense of safety which may decrease reactivity and hence involvement in fights. Alternatives to carrying weapons are necessary because even if fights decrease, a physical fight with a weapon involved can have a much more devastating consequence.
6. Public policies in Portugal must take gender and age specificities on board while designing and implementing preventive interventions with pupils and families, in the school and in the community, e.g., making available, at a school or municipality level, psychoeducational programs aiming at promoting interpersonal communication, problem solving, emotions management, anger management and assertiveness training.

## Abstract

**Aim:** To analyse gender differences and associations regarding physical fights and their relationship with other health compromising behaviours.

**Methods:** Participants consisted of 5,423 Portuguese adolescents in the context of the Health Behaviour in School-aged Children/World Health Organization study. Independent Chi-Square, Independent Sample T-tests were used to analyse the relationship between physical fights involvement and health compromising behaviour. Binary logistic regressions were conducted to analyse the associations between physical fights involvement and variables with statistical significance for at least one gender in preliminary bivariate analysis. Regression analyses were stratified by gender adjusted by age.

**Result:** 21.3% of the adolescents reported at least one fighting episode. 61.1% of fights occurred in school. Students from 6<sup>th</sup> grade had a higher involvement in fights than 10<sup>th</sup> grade students. For both genders, fighting occurrence is related to consumptions (alcohol, drugs use), violence (being bullied, being a bully, carrying weapons and safety perception at school). Boys from Alentejo region, 6<sup>th</sup> grade and who practice physical activity, reported more physical fights involvement. For boys, carrying weapons decreases the probability of fights occurrence in school.

**Conclusion:** This study confirms the impact of physical fighting in Portuguese adolescents and emphasizes that specific strategies to address this physical fighting are important. Public policies must take gender and age specificities into consideration while designing and implementing preventive interventions with pupils and families, in the school and in the community, in order to promote a safer environment at school and an adolescents' positive development. Active social support from peers, parents, teachers and school staff is needed so that weapons are not used as a way to secure schools' environment. National strategies and interventions in school context must be prioritized with regional focus in order to address regional specificities.

## Keywords

Adolescent Health; Health Promotion; Physical Fights; Protective Behaviour; Risk Behaviour; School Fighting; Youth Violence

## Introduction

Adolescence is the beginning of the development of individual autonomy in which decision-making can have repercussions on one's health [1,2]. Many behaviours have a positive (protective behaviour) or negative impact (risk behaviour) on health, based

on the choices made by adolescents everyday [3].

Physical violence is defined as intentional physical force against itself or against others (interpersonal or collective), which can have serious consequences, such as injury and/or death [4,5]. Currently, youth violence levels are lower than in the last 10 years. Despite this positive decline, physical fights remain a global public health concern [2,4,6]. The significance of this problem led the WHO to sensitize 133 countries to the implementation of health policies to prevent violence among young people. Only a third part of the countries have implemented programs in this direction [1,7]. The estimated prevalence among children and adolescents ranges from 10% to 65% among countries at the global level [5]. Regarding the gender, in Europe and North America the involvement of boys in fights range from 37% to 69% whereas girls from 13% to 32% [7].

Physical fights are one of the main causes of child morbidity and mortality. In Europe and America, they are one of the leading causes of death among adolescents over 15 years of age [8]. The higher levels of violence are directly associated with socioeconomic factors. Inequality in social hierarchies promotes a more rigid social environment, increasing the probability of fights occurrence, violent crime, homicide and gun violence [2,9-11]. Fights involvement is directly associated with other risk behaviours, such as alcohol and / or drug use, bullying or carrying weapons [12-14]. Regarding the practice of physical activity, in general, a positive association with health behaviours can be observed; However, it is also associated with violent behaviours, injuries occurrence and alcohol abuse [15]. Previous studies have identified gender differences in physical fights involvement [2]. Overall, boys engage in fights more than girls [6,12]. On the other hand, girls had more mental health issues than boys [2,16]. Risk factors for perpetration of violence include male gender, younger age, substance use and other risk behaviours [17].

The school is a privileged setting for the implementation of interventions and health promotion programs [18]. The programs implemented in the school context are more effective in empowering students to manage conflicts in a moderate, non-violent and effective way [2,19]. Over the time, adolescents who feel more attached to school reveal lower levels of violent behaviours [20]. Peer's support is an important determinant for individual development. Either lack of this support, lack of being accepted or feeling unsafe at school place these children at risk of higher levels of bullying [12]. Active support from teachers and from other school staff is related to lower levels of risk behaviours such as bullying and physical fights. Teachers and school staff occupy a prominent position in promoting healthy and friendly relationships and environments as well as in interfering earlier in situations of violence [21]. The analysis

of 9 European countries revealed that appropriate social support is a preventive factor against physical fighting and other forms of violence, such as bullying in adolescents [12].

The present study aims to add to previous research, as described before, an in-depth analyse of: a) The relationship between physical fights (inside and outside school) and adolescent risk behaviours, safety perception at school and the practice of physical activity; b) Gender, grade and regional differences regarding physical fights involvement and its relation with risk behaviours, safety perception at school and physical activity; c) The associations between the physical fights involvement, physical activity, safety perception at school and risk behaviours (use of alcohol and drugs, carrying weapons, bullying) stratified by gender. All the relationships among variables just mentioned are not new, but the novelty of the present study is not only to analyse these patterns of associations, using a large sample with national representation, but also how these models keep the same structure or get altered if sub-samples of the participants are considered, namely gender and age group separately. This in-depth analysis will raise awareness of how educational public policies must fit inter-individual differences.

## Methods

The participants of this study include adolescents from the Health Behaviour in School-Aged Children - HBSC 2014 study [22]. The global sample consist of 6,026 Portuguese adolescents, randomly selected from 36 national groups of public schools, aged between 10 and 20 years, attending the 6<sup>th</sup>, 8<sup>th</sup>, and 10<sup>th</sup> grades. The schools represented the entire country, stratified by region. The total number differed according to the sub-sample used (6<sup>th</sup>, 8<sup>th</sup> and 10<sup>th</sup> grades); reporting if they have been involved in a physical fighting in the last year, considering that some participants have not replied to some questions. For this study, only students who answered the questions related to physical fighting involvement were considered.

HBSC is a collaborative study by the World Health Organization (WHO), undertaken by 44 countries, that aims to investigate health and risk behaviours in adolescence and their life context. The HBSC 2014 survey was, like previous waves, nationally representative. A detailed description of the research methods and instrument can be accessed elsewhere [22-24]. Helsinki declaration principles were strictly followed. The survey was approved by the Ministry of Education and had a positive review from a national ethics committee. School and active parental informed consents were obtained. There were no explicit incentives provided for participation, and students' participation was anonymous and voluntary. Students who were absent from school on the day of the survey were not included. The administration of the surveys was conducted according to standard guidelines from the HBSC survey protocol [23,24]

and was carried out by trained teachers during class time.

## Measures

For this study, issues related to socio-demographic characteristics (gender, age, region and school grade) are included (Table 1) to analyse physical fights involvement. Table 2 describes all variables used in this study. The variable physical fights involvement was obtained by answering the question: 'During the last 12 months, how many times have you been involved in a physical fight?'. Then, in the second step, the variable related to where the fights took place (inside or outside of school context) was obtained by answering the question: 'The last time you were involved in a fight, where did it take place?'. To determinate the adolescent alcohol uses in the last 30 days, they answered the question 'In the last 30 days, how many days did you drink alcohol?'. Drug use in the last 30 days was obtained through the question 'How many times have you used illegal drugs in the last 30 days?'. Behaviour risks, like carrying weapons in the last 30 days, was determined through the adolescents' answers to the question 'In the last 30 days, how many days did you carry a weapon, such as a knife or a gun?'. Being a bully was determined by answering 'How many times did you take part in bullying other student(s) at school in the last 2 months?'. Being bullied in the last 60 days was determined through the question 'How many times where you bullied at school in the last 2 months?'. The safety perception was determined by answering 'Do you feel safe at school?'. To determine physical activity adolescents were asked to rate the number of days over the last 7 days in which they were physically active for a total of at least 60 minutes per day. All variables were recoded to the analysis. The range of all variables included in the study, are described in table 2.

## Statistical Analyses

For all variables, descriptive statistics were calculated (means, standard deviation, and percentages) and as the distribution of the physical fight involvement was different for boys and girls, in posterior analysis the sample was split by gender. Independent Chi-Square tests were used to analyse the relationship between physical fights involvement and socio-demographic characteristics (region, school grade), alcohol use, drugs use, being bullied, being a bully, carrying weapons and safety perception at school. Independent Sample T-tests were used to analyse the relationship between physical fights involvement and physical activity. Binary logistic regressions models were conducted in order to analyse the associations between physical fights involvement and variables with statistical significance for at least one gender in preliminary bivariate analysis (qui-squares). Independent variables were entered at the same time (using the procedure ENTER). Associations between physical

Study variables	Range		
	Sex	1 = Boy	2 = Girl
Age (years old)	Minimum = 10	Maximum = 20	
School grade	1 = 6 <sup>th</sup> grade	2 = 8 <sup>th</sup> grade	3 = 10 <sup>th</sup> grade
Region	1 = North 4 = Alentejo	2 = Center 5 = Algarve	3 = Lisbon District
Physical Activity (last 7 days)	0 = 0 day; 1 = 1 day...	7 = 7 days	
Alcohol Consumption* (last 30 days)	1 = No, Never 4 = Yes, 4-10 times	2 = Yes, 1 time 5 = Yes, more than 10 times	3 = Yes, 2-3 times
Drug Consumption* (last 30 days)	1 = Never 4 = Regular Consumption	2 = 1 time	3 = More than 1 time
Bullied* (last 60 days)	1 = Never 4 = About Once in a week	2 = 1-2 times 5 = Several times a week	3 = 2-3 times in a month
Bully (last 60 days) *	1 = Never 4 = About Once in a week	2 = 1-2 times 5 = Several times a week	3 = 2-3 times in a month
Carry weapons* (last 30 days)	1 = Never 4 = 4-5 days	2 = 1 day 5 = 6 or more days	3 = 2-3 days
Safety Perception at school*	1 = Always 4 = Rarely	2 = Frequently 5 = Never	3 = Sometimes
Fights Involvement (last year) *	1 = Never 4 = 3 times	2 = 1 time 5 = 4 times, or more	3 = 2 times
Fight's Local (last time) *	1 = Didn't had fights 4 = On the street	2 = At home 5 = Another local	3 = At school

\* This variable was recoded.

**Table 1:** Variables description included in the study. (n=5423).

	M ± SD or % (n)			p
	Total (n = 5423)	Boys (n = 2581)	Girls (n = 2842)	
Age (years) <sup>2</sup>	13.8 ± 1.7	13.84 ± 1.7	13.84 ± 1.7	NS
School grade <sup>1</sup>				0.004
6 <sup>th</sup> grade	33.2 (1802)	34.1 (880)	32.4 (922)	
8 <sup>th</sup> grade	40.1 (2173)	41.3 (1066)	39.0 (1107)	
10 <sup>th</sup> grade	26.7 (1448)	24.6 (635)	28.6 (813)	
Region <sup>1</sup>				0.011
North	42.4 (2297)	44.1 (1138)	40.8 (1159)	
Centre	16.8 (912)	15.8 (408)	17.7 (504)	
Lisbon District	20.3 (1103)	18.9 (488)	21.6 (615)	
Alentejo	12.1 (657)	12.3 (318)	11.9 (339)	
Algarve	8.4 (454)	8.9 (229)	7.9 (225)	
Alcohol (last 30 days) <sup>1</sup>				0.030
No	95.6 (3515)	95.0 (2451)	96.1 (2728)	
Yes	2.4 (85)	5.0 (129)	3.9 (111)	
Drugs <sup>1</sup>				<0.001
No	97.6 (3515)	96.4 (1629)	98.7 (1886)	
Yes	2.4 (85)	3.6 (61)	1.3 (24)	
Bullied (last 60 days) <sup>1</sup>				<0.001
No	61.3 (3323)	58.8 (1518)	63.5 (1805)	
Yes	38.7 (2100)	41.2 (1063)	36.5 (1037)	
Bully (last 60 days) <sup>1</sup>				<0.001
No	69.1 (3748)	63.0 (1626)	74.7 (2122)	
Yes	30.9 (1675)	37.0 (955)	25.3 (720)	

Carry weapons <sup>1</sup>				
No	94.3 (5053)	90.3 (2293)	97.9 (2760)	<0.001
Yes	5.7 (304)	9.7 (245)	2.1 (59)	
Safety perception at school <sup>1</sup>				NS
No Feel Safety	6.1 (328)	6.5 (166)	5.7 (162)	
Feel Safety	93.9 (5053)	93.5 (2395)	94.3 (2658)	
Physical activity (last 7 days) <sup>2</sup>	3.7 ± 2.0	4.3 ± 2.1	3.2 ± 1.8	<0.001
Fights (last year) <sup>1</sup>				<0.001
No	78.7 (4267)	68.6 (1770)	87.9 (2497)	
Yes	21.3 (1156)	31.4 (811)	12.1 (345)	
Fight's local (last time) <sup>1</sup>				<0.001
Out of School	38.9 (535)	32.9 (298)	50.6 (237)	
In School	61.1 (839)	67.1 (608)	49.4 (231)	
<sup>1</sup> Chi-square; <sup>2</sup> Independent Sample t-test				
Abbreviations: M - Mean; NSSI - Non-Suicidal Self-injury; SD - Standard Deviation; NS - Not Significant				
<b>Table 2:</b> Participants' characteristics.				

fights involvement and alcohol use, drugs use, being bullied, being a bully, carrying weapons, safety perception at school and physical activity were analysed. Associations between where the fights took place (inside and outside of school) and alcohol use, drugs use, being a bully, carrying weapons and physical activity were analysed. Regression analyses were stratified by gender adjusted by age. Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS), version 24 (IBM Corp., Armonk, NY). The significance level was set at  $p < 0.05$ .

## Results

For this study, only the students who answer the questions related to fights involvement were considered. A sub-sample of the representative sample consisted of 5,423 students. The sub-sample having a mean age of 13.8 years old ( $SD \pm 1.7$ ), attending the 6<sup>th</sup> (33.2%), 8<sup>th</sup> (40.1%) and 10<sup>th</sup> grades (26.7%).

Regarding physical fights involvement, 21.3% of the adolescents report at least one episode of physical fights in the past year. Taking into account the site where the fight took place, 61.1% of the fights occurred in school.

Table 3 describes the results of bivariate analysis for physical fights involvement, the site where the fight occurred and region, school grade, consumptions (alcohol, drugs), violence (being bullied, being a bully, carrying weapons), safety perception at school and physical activity. The occurrence of physical fights in both genders is related to consumptions (alcohol, drugs), violence (being bullied, being a bully, carrying weapons) and feeling less safe at school. For boys, physical fights involvement is also related with the increased practice of physical activity. It was observed a relation between physical fights involvement and region and a relation between school grades, also for

boys. Most boys from Centre region and 10<sup>th</sup> grade was less involved in physical fights in the last year. At the same time, boys from Alentejo and 6<sup>th</sup> grade reported more physical fights in the last year.

For both genders, the site where the fights occurred is related to the school grade, alcohol use, being a bully and carrying weapons. For both genders it was observed a relation between the site of occurrence of the physical fights and the school grade. Most of the students from 6<sup>th</sup> grade reported more fights involvement in school. In contrast, students from 10<sup>th</sup> grade reported physical fights involvement in other places outside of school.

Table 4 shows the results of binary logistic regression analysis for the associations between physical fights involvement and significant variables for at least one gender according to previous qui-squared analyses. The associations analysed were between physical fights involvement and consumptions (alcohol use), violence (being bullied, being a bully, carrying weapons), safety perception at school and physical activity stratified by gender and adjusted by age. For both genders, alcohol use and violence (being bullied, being a bully, carrying weapons) was positively associated to physical fights involvement. Drugs use was positively associated to physical fights involvement, only for girls. Safety perception at school was negatively associated to physical fights involvement, only for girls as well.

Table 5 shows the results of binary logistic regression analysis for the associations between the site where the physical fights occurred and significant variables for at least one gender. The associations analysed were between the site of occurrence and consumptions (alcohol use), violence (being a bully, carrying weapons), and physical activity stratified by gender and adjusted by age. Carrying weapons had a negative association for the occurrence of physical fights in school only for boys.

	Fights involvement						Fights in and out of school					
	No	Yes	p	No	Yes	p	Out of School	In School	p	Out of School	In School	p
	Boys			Girls			Boys			Girls		
	% or M ± SD			% or M ± SD			% or M ± SD			% or M ± SD		
Region <sup>1</sup>	67.7	32.3		89.8	10.2		30.3	69.7		46.8	53.2	
North	70.5	29.5		86.8	13.2		41.4	58.6		50.8	49.2	
Lisbon District	*74.3	25.7	0.018	87.3	12.7	0.085	34.4	65.6	0.07	54.9	45.1	0.373
Center	63.5	*36.5		85.0	15.0		29.3	70.7		58.0	42.0	
Alentejo	65.9	34.1		86.2	13.8		29.3	70.7		41.7	58.3	
Algarve												
School grade	62.3	*37.7	<0.001	86.6	13.4	0.16	22.5	*77.5	<0.001	37.3	*62.7	<0.001
6 <sup>th</sup> grade	68.7	31.3		87.7	12.3		33.1	66.9		50.8	49.2	
8 <sup>th</sup> grade	*77.2	22.8		89.5	10.5		*48.8	51.2		*63.1	36.9	
10 <sup>th</sup> grade												
Alcohol <sup>1</sup>	69.7	30.3	<0.001	88.6	14.4	<0.001	31.0	69.0	<0.001	49.3	50.7	0.045
No	47.3	52.7		68.5	31.5		58.1	41.9		64.3	35.7	
Drugs <sup>1</sup>	73.1	26.9	<0.001	88.8	11.2	0.001	37.3	62.7	0.003	56.2	43.8	0.565
No	41.0	59.0		62.5	37.5		63.6	36.4		58.3	41.7	
Bullied <sup>1</sup>	79.8	20.2	<0.001	93.4	6.6	<0.001	42.0	58.0	<0.001	49.2	50.8	0.338
No	52.6	47.4		78.2	21.8		26.2	73.8		51.6	48.4	
Bully <sup>1</sup>	81.6	18.4	<0.001	92.3	07.7	<0.001	39.4	60.6	<0.001	54.6	45.4	0.041
No	46.4	53.6		74.7	25.3		28.2	71.8		46.1	53.9	
Carry weapons <sup>1</sup>	72.1	27.9	<0.001	88.6	11.4	<0.001	30.5	69.5	<0.001	49.3	50.7	0.045
No	35.9	64.1		52.5	47.5		45.7	54.3		65.7	34.3	
Safety Perception at school <sup>1</sup>												
No	45.2	54.8	<0.001	74.1	25.9	<0.001	27.5	72.5	0.177	54.5	45.5	0.301
Yes	70.1	29.9		88.7	11.3		33.3	66.7		49.8	50.2	
PA <sup>2</sup>	4.2+/-2.0	4.5+/-2.1	<0.001	3.2+/-1.8	3.4+/-2.0	0.096	4.3+/-2.1	4.4+/-2.1	0.875	3.0+/-1.8	3.4+/-2.0	0.023

<sup>1</sup>Chi-square; <sup>2</sup>student t-test; \* Adjusted standardized residuals > 1.96

**Table 3:** Bivariate analysis between Fights Involvement and Fights In and Out of School by gender (Chi-square and Student t-test).

		$\beta$	S.E.	Sig	OR	95% CI
Boys	Alcohol	0.852	0.236	0.000	2.345	1.477-3.723
	Drugs	0.432	0.317	0.173	1.541	0.828-2.868
	Bullied	0.675	0.133	0.000	1.965	1.514-2.551
	Bully	1.040	0.133	0.000	2.829	2.179-3.671
	Carry weapons	1.199	0.189	0.000	3.317	2.289-4.806
	Safety Perception	-0.412	0.242	0.088	0.662	0.412-1.064
	PA	0.053	0.030	0.077	1.055	0.994-1.119
	Constant	0.017	0.844	0.984	1.017	
Model $\chi^2= 283.730, p<0.001$						
Nagelkerke= 0.226						
		$\beta$	S.E.	Sig	OR	95% CI
Girls	Alcohol	0.980	0.254	0.000	2.664	1.619-4.382
	Drugs	1.106	0.508	0.029	3.023	1.118-8.176
	Bullied	0.941	0.169	0.000	2.562	1.839-3.569
	Bully	0.807	0.169	0.000	2.242	1.609-3.123
	Carry weapons	1.310	0.339	0.000	3.706	1.908-7.199
	Safety Perception	-0.836	0.244	0.001	0.433	0.269-0.700
	PA	0.011	0.044	0.802	1.011	0.928-1.101
	Constant	-4.012	1.021	0.000	0.018	
Model $\chi^2= 169.323, p<0.001$						
Nagelkerke= 0.168						
Abbreviations: OR - Odds Ratio; CI - Confidence Interval; PA - Physical Activity The results were adjusted for age.						

**Table 4:** Logistic regression between fights involvement - Gender.

		$\beta$	S.E.	Sig	OR	95% CI
Boys	Alcohol	-0.433	0.311	0.164	0.649	0.353-1.193
	Drugs	-0.651	0.412	0.114	0.521	0.233-1.169
	Bullied	0.356	0.199	0.074	1.428	0.966-2.109
	Bully	0.193	0.203	0.341	1.213	0.815-1.804
	Carry weapons	-0.872	0.256	0.001	0.418	0.253-0.691
	PA	0.023	0.044	0.606	1.023	0.938-1.116
	Constant	4.871	1.2	0.000	130.493	
	Model $\chi^2= 54.596, p<0.001$					
Nagelkerke= 0.123						
		$\beta$	S.E.	Sig	OR	95% CI
Girls	Alcohol	-0.388	0.371	0.295	0.678	0.328-1.403
	Drugs	0.093	0.613	0.880	0.911	0.274-3.032
	Bullied	-0.330	0.247	0.182	0.719	0.443-1.168
	Bully	0.379	0.251	0.131	1.461	0.894-2.387
	Carry weapons	-0.402	0.421	0.339	0.669	0.293-1.527
	PA	0.092	0.061	0.129	1.097	0.973-1.236
	Constant	0.370	1.459	0.800	1.447	
	Model $\chi^2= 7.712, p<0.001$					
Nagelkerke= 0.032						
Abbreviations: OR - Odds Ratio; CI - Confidence Interval; PA - Physical Activity The results were adjusted for age.						

**Table 5:** Logistic regression between fights in and outside school - Gender.

## Discussion

The aim of this study was to analyse gender differences and associations regarding to physical fights involvement and the fights location (inside and outside of school) and their relationship with risk and protective behaviours, safety perception at school and physical activity of Portuguese adolescents. Most of the students (78,7%) were not involved in physical fights in the last year. This outcome enforces the positive decrease of global young violence. Physical fights remain a global public health concern [4,6]. The results showed that when adolescents were involved in physical fights, most of the times they occurred in school context and in the same global range [5]. In terms of age and gender, the youngest boys had a major involvement in physical fights [2,12]. These risk factors are well described in many previous studies. Risk factors for perpetration of violence usually appear among younger boys with substances consumption problems and other risk behaviours [17].

The main finding revealed that, in both gender, physical fights involvement had a positive association with alcohol use, being bullied, being a bully and carrying weapons. In line with previous studies, fights involvement is directly associated with other high-risk behaviours, like alcohol and drug use, bullying and carrying weapons [12-14].

In this study, girls were less physically active than boys. More physical activity practice had a relation with physical fights occurrence for boys, and a relation for physical fights involvement in school for girls. Although physical activity had a positive association with health behaviours, it may also be associated with violent behaviours, injuries occurrence and alcohol abuse [7,15]. There is still a lack of research regarding the usefulness of physical activity in understanding and predicting physical fights involvement and their site of occurrence.

On the other hand, safety perception at school had a negative association with physical fights occurrence in girls. Adolescents who don't feel safe at school or feel at risk for some reason are the ones who will possible engage in risk behaviours. Either lack of support, lack of being accepted or feeling unsafe at school place these children at risk of higher levels of bullying [12].

For boys, carrying weapons was negatively associated to physical fights involvement in school context. Carrying weapons to school presents a risk factor to fighting [12-14] and can increase the probability of violent crime occurrence and of several injuries [2,9-11].

Violence, in a global way, it's a multifactorial phenomenon

that need the involvement and support from peers, parents, family and teachers [12]. Physical violence which occurs in school, most of the times is unknown or ignored by parents and teachers. School violence is still seen as a typical and normal part of the development and of growing-up [12]. Parents and teachers need to promote healthy behaviours and social competences to decrease violence in general and especially in the school context. The present results suggest that although physical fights + are less frequent in girls, the ones who get actually involved in violence tend to be more at a risk than boys, belonging more frequently to smaller but more deviant groups (e.g. Drug users).

Regarding age, physical fights in schools tend to be more frequent in younger boys, and older boys tend to get involved in other forms of violence, out of school, suggesting that they would be a smaller but a more deviant group.

There are some limitations that should be considered when analysing these results. Firstly, the data were self-reported by adolescents and may reflect bias (e.g. social desirability in the responses). Secondly, the measures represent students in school age who belong to the Portuguese public-school system, so the results cannot be generalized to the same school years and the same gender of other Portuguese students (e.g. Those who have dropped out or those who belong to the private school system). Thirdly, the analysis was based on cross-sectional data, which do not permit temporal organization and causality inference. Despite these limitations, the results from this study can be used to empirically document a relatively high overlap about physical fights among young people. Moreover, it appears that there are shared and specific characteristics that may be incorporated in future research and prevention programs of physical fights involvement which occur inside and outside of the school context, among vulnerable adolescents.

The social context, health behaviour and lifestyle of the adolescents need to be linked for a better understanding of physical fights involvement and to define prevention strategies. In Portugal there is no systematic national strategy to prevent physical fights in adolescents and to promote adolescent health. Preventable strategies focusing on the school context should be a future consideration with active support from teachers and school staff.

## Conclusion

The occurrence of physical fights in school has a high prevalence (61.1%). The novelty of the present study is not only to analyse patterns of associations of high-risk behaviours, using a large sample with national representation, but also how these models get altered if sub-samples of the participants are considered,

namely gender and age group separately. This in-depth separated analysis rises awareness of how educational public policies must fit inter-individual differences: Youngest students from 6<sup>th</sup> grade reported more physical fights involvement in school context; suggesting that later on either peer to peer violence fades or it takes more internalised forms, whose effects must be considered; girls had more risk behaviours associated with physical fights occurrence than boys, this fact suggests that the impact of physical fights upon girls has a more undermining effect on their well-being. For boys, carrying weapons decrease the probability of physical fights occurrence in school context. Alternatives to carrying weapons are necessary because even if fights decrease, a physical fight with a weapon involved can have a much more devastating consequence. Public policies in Portugal must take gender and age specificities on board while designing and implementing preventive interventions with pupils and families, in the school and in the community (e.g. making available at a school or municipality level, psychoeducational programs aiming at promoting interpersonal communication, problem solving, emotions management; anger management; assertiveness training).

Reducing risk behaviours for the occurrence of physical fights must thus consider pupils' age, gender and socioeconomic differences and should be focused on intra and interpersonal, community and even political influences. Psychoeducational programs will help adolescents to better self-regulate, seek social support and make better choices to maintain a healthy lifestyle. The present findings draw attention to the importance of helping adolescents to find alternatives, to recognize and to deal with their own emotions and physical changes without violence.

Finally, this study confirms the impact and importance of physical fight involvement in Portuguese adolescents. Portugal, even though it is a small country, has regional differences. This fact reinforces the importance of developing public health policies thinking globally but keeping a regional focus.

## References

1. WHO (2014) Adolescents' health-related behaviours: Violence and injuries.
2. WHO (2016) Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health behaviour in school-aged children (HBSC) study: international report from the 2013/2014 survey. HEALTH POLICY FOR CHILDREN AND ADOLESCENTS, NO. 7: World Health Organization, Regional Office for Europe.
3. Pickett W, Craig W, Harel Y, Cunningham J, Simpson K, et al. (2005) Cross-national study of fighting and weapon carrying as determinants of adolescent injury. *Pediatrics* 116: 855-863.
4. Hussin S, Aziz N, Hasim H, Sahril N (2014) Prevalence and Factors Associated With Physical Fighting Among Malaysian Adolescents. *Asia-Pacific Journal of Public Health* 26: 108-115.
5. Karmaliani R, Mcfarlane J, Somani R, Khuwaja H, Bharmani S, et al. (2017) Peer violence perpetration and victimization: Prevalence, associated factors and pathways among 1752 sixth grade boys and girls in schools in Pakistan. *PLoS ONE* 12: 0180833.
6. Walsh SD, Molcho M, Craig W, Harel-Fisch Y, Huynh Q, et al. (2013) Physical and emotional health problems experienced by youth engaged in physical fighting and weapon carrying. *PLoS ONE* 8: 56403.
7. Yang L, Zhang Y, Xi B, Bovet P (2017) Physical fighting and associated factors among adolescents aged 13-15 years in six Western Pacific Countries. *International Journal of Environmental Research and Public Health* 14: 1427.
8. Mokdad AH, Forouzanfar MH, Daoud F, Mokdad AA, El Bcheraoui C, et al. (2016) Global burden of diseases, injuries, and risk factors for young people's health during 1990-2013: A systematic analysis for the global burden of disease study 2013. *Lancet* 387: 2383-2401.
9. Elgar F, McKinnon B, Walsh SD, Freeman J, Donnelly P, et al. (2015) Structural Determinants of Youth Bullying and Fighting in 79 Countries. *Journal of Adolescent Health* 57: 643-650.
10. Elgar FJ, Aitken N (2011) Income inequality, trust and homicide in 33 countries. *Eur J Public Health* 21: 241-246.
11. Shetgiri R, Kataoka S, Ponce N, Flores G, Chung PJ (2010) Adolescent fighting: racial/ethnic disparities and the importance of families and schools. *Academic pediatrics* 10: 323-329.
12. Šmigelskas K, Vaiciunas T, Lukoseviciute J, Malinowska-Cieslik M, Melkumova M, et al. (2018) Sufficient social support as a possible preventive factor against fighting and bullying in school children. *International Journal of Environmental Research and Public Health* 15: 870
13. Djerboua M, Chen B, Davison C (2016) Physical fighting, fighting related injuries and family affluence among Canadian youth. *BMC Public Health* 16: 199.
14. Reingle JM, Jennings WG, Maldonado-Molina MM (2012) Risk and protective factors for trajectories of violent delinquency among a nationally representative sample of early adolescents. *Youth Violence Juv Justice* 10: 261-277.
15. Matos M, Calmeiro L, Marques A, Loureiro N (2013) Does Physical Activity Promotion Advantages Need the Identification of Associated Health Compromising Features such as Injuries, Alcohol Use and Interpersonal Violence? Highlights from HBSC/WHO Portuguese Survey. *Journal Child Adolescence Behaviour* 1: 113.
16. Hurrelmann K, Richter M (2006) Risk behaviour in adolescence: the relationship between developmental and health problems. *J Public Health* 14: 20-28.
17. Shetgiri R (2013) Bullying and victimization among children.

- Advances in Pediatrics 60: 33-51.
18. Stewart-Brown S (2006) What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?. Copenhagen: WHO Regional Office for Europe
  19. Matos MG, Gaspar T, Ferreira M, Tomé G, Camacho I, et al. (2012) Keeping a focus on self-regulation and competence: "find your own style", A school based program targeting at risk adolescents. *Journal of Cognitive and Behavioral Psychotherapies* 12: 39-48.
  20. Fraser MW (1996) Aggressive behavior in childhood and early adolescence: an ecological-developmental perspective on youth violence. *Social Work* 41: 347-361.
  21. Pepler D, Craig W, Connolly J, Yuile A, McMaster L, et al. (2006) A developmental perspective on bullying. *Aggressive Behavior* 32: 376-384.
  22. Matos M, Simões C, Camacho I, Reis M (2015) Equipa Aventura Social. A Saúde dos Adolescentes Portugueses em tempos de recessão. HBSC 2014. [The health of portuguese adolescents in times of recession]. CMDT/DGS/FMH/Universidade de Lisboa, Portugal.
  23. Currie C, Molcho M, Boyce W, Holstein B, Torsheim T, et al. (2008) Researching health inequalities in adolescents: the development of the Health Behaviour in School-Aged Children (HBSC) family affluence scale. *Soc Sci Med* 66: 1429-1436.
  24. Roberts C, Freeman J, Samdal O, Schnohr CW, de Looze ME, et al. (2009) The Health Behaviour in School-aged Children (HBSC) study: methodological developments and current tensions. *Int J Public Health* 54: 140-150.