

# Physical aggression among adolescents from Santa Catarina: association with sociodemographic factors and physical activity

## *Envolvimento em brigas entre adolescentes de Santa Catarina: associação com fatores sociodemográficos e atividade física*

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**Abstract** – The aims of the present study were to evaluate possible gender differences in the prevalence of physical aggression among adolescents, and to examine the association between sociodemographic factors and physical activity participation with physical aggression in boys and girls. The sample was composed of 6,529 high school students (aged 15-19 years) from public schools of the state of Santa Catarina. A questionnaire was applied to collect data regarding sociodemographic factors, involvement in physical aggressions and types of physical activity. Crude and adjusted binary logistic regression models were performed. Boys reported more involvement in physical aggression episodes (36.9%) compared to girls (26.0%,  $p < 0.05$ ). Boys who lived in urban areas (OR: 1.45) and did not live with the family (OR: 2.22), as well as girls enrolled in the night shift were more likely to engage in fights (OR: 1.26). Adolescents aged 17-19 years had reduced chances of getting involved in fights (OR<sub>Boys</sub>: 0.66; OR<sub>Girls</sub>: 0.80) compared to younger ones. The practice of team sports among boys (OR: 1.56) and the combined practice of team sports and individual physical activities among boys (OR: 1.91) and girls (OR: 1.36) were associated with physical aggressions. It was concluded that boys were more likely to engage in fights, mainly younger boys, who did not live with family and lived in urban areas. In boys and girls, the involvement in physical aggression was greater among those who are engaged in team sports.

**Key words:** Aggression; Cross-sectional studies; Motor Activity; Violence.

**Resumo** – Os objetivos do presente estudo foram testar possíveis diferenças entre os sexos quanto ao envolvimento em brigas nos últimos 12 meses e analisar a associação desse comportamento com fatores sociodemográficos e a participação em atividade física em rapazes e moças. Foram avaliados 6529 estudantes (15 a 19 anos) do ensino médio da rede pública estadual do estado de Santa Catarina. Dados sociodemográficos, o envolvimento em brigas e os tipos de atividades físicas foram investigados por meio de questionário previamente testado. Utilizou-se de análises de regressão logística binária bruta e ajustada. Os rapazes (36,9%) relataram maior envolvimento em brigas em relação às moças (26,0%,  $p < 0,05$ ). Rapazes que residiam em área urbana (OR: 1,45) e não moravam com a família (OR: 2,22), assim como moças que estudavam no período noturno (OR: 1,26) apresentaram maiores chances de envolverem-se em brigas. Adolescentes de 17 a 19 anos possuíam chances reduzidas de envolverem-se em brigas (OR<sub>Rapazes</sub>: 0,66; OR<sub>Moças</sub>: 0,80) comparados aos de 15 e 16 anos. A prática de atividades coletivas nos rapazes (OR: 1,56) e a prática combinada de atividades coletivas e individuais em rapazes (OR: 1,91) e moças (OR: 1,36) foram associadas ao envolvimento em brigas. Conclui-se que rapazes foram mais propensos a se envolverem em brigas, principalmente os mais novos, aqueles que não moravam com a família e que residiam em área urbana. Em ambos os sexos, o envolvimento em brigas foi maior entre os praticantes de atividades físicas coletivas.

**Palavras-chave:** Agressão; Atividade Motora; Estudos Transversais; Violência.

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## INTRODUCTION

Characterized as a multi-causal problem that has a strong relation with behavioral aspects, sociocultural and economic inequalities, violence has become a public health problem in Brazil, especially among adolescents<sup>1</sup>. Violence in its different manifestations results in losses of physical and mental health, being related to school dropout, low school performance, suicidal ideation and violent behaviors<sup>2</sup>. However, the literature lacks of studies on interpersonal physical violence that seek to identify sociocultural and demographic factors associated with the occurrence of physical aggression in this population<sup>3</sup>.

With regard to the prevalence of involvement in fights among adolescents, it is known that boys are more involved in physical aggressions when compared to girls<sup>4-6</sup>, because they resort to violence more frequently to deal with interpersonal conflicts<sup>5</sup>. On the other hand, girls tend to have low or no aggressive behavior, contrasting with the aggressiveness of boys<sup>7</sup>. Although there is evidence that the behavior investigated is distinct between boys and girls, it is unclear in literature which factors are related in each sex.

The sociodemographic characteristics present distinct relationships with certain health risk behaviors in adolescents<sup>6</sup>. For example, there is no consensus about the role of family cohabitation in relation to physical aggression episodes, since there is a study<sup>5</sup> indicating that there are no associations, while others<sup>6,8</sup> show that living with the family and in rural areas reduce the risk of involvement in fights in this population.

The literature shows the relationship between physical aggression and different behaviors, such as the consumption of alcoholic beverages and illicit drugs<sup>5</sup>. Some studies have found that participation in sports<sup>9</sup>, in moderate to vigorous physical activity<sup>10</sup> and in physical education classes<sup>3</sup> is associated with involvement in fights. It is believed that the manifestation of aggression presents itself differently in different types of PA, since they have different characteristics. Therefore, to identify which types of activities expose adolescents to involvement in fights would aid in investigating determinants of aggression manifestation in this population. In this context, this study aims to verify possible differences between sexes regarding involvement in fights in the last 12 months and to analyze the association of sociodemographic factors and participation in different types of PA with the involvement in fights in the last 12 months among boys and girls.

## METHODOLOGICAL PROCEDURES

The present study is an analysis of data from the “Lifestyle and risk behavior of young people from Santa Catarina - CompAC” research, characterized as a cross-sectional, school-based and statewide study carried out in 2011. The sample consisted of adolescents of both sexes regularly enrolled in state public high schools of Santa Catarina aged 15-19 years ( $16.3 \pm 1.0$ ).

Data from the 2010 School Census (205,572 students enrolled in high schools) were used for the sample calculation, considering the following parameters: unknown prevalence of the investigated phenomenon of 50%, confidence interval of 95% and maximum error of two percentage points. Thus, a minimum sample size of 2,373 students was obtained, multiplied by two ( $n = 4,746$ ) for the design effect, and 25% were added for possible cases of losses or refusals, reaching sample size of 5,932 students. Detailed information on the methodological aspects can be consulted in a previous publication<sup>11</sup>.

To collect information, a questionnaire previously tested and validated for the target population was used<sup>11,12</sup>. The application of the questionnaire was carried out in a classroom directed by a previously trained researcher. The researcher read all the questions while another member of the team clarified the possible doubts of interviewees. Information on involvement in fights in the last 12 months (outcome) was obtained by asking the question, "During the past 12 months, how many times have you been involved in a fight?", whose answers (none, once, 2 or 3 times, 4 or 5 times, 6 or 7 times, 8 or more times) were grouped into "no involvement in fights" and "involvement in one or more fights". The sociodemographic information evaluated was: gender, age, study shift, school grade, area of residence, living with family, work and family income; and their respective categories of analysis are presented in Table 1.

To measure the type of PA, a checklist with 19 options of activities was used. Adolescents were instructed to indicate the response options regarding the types of PA performed during leisure time, which were categorized for analysis purposes in collective activities (basketball, soccer, volleyball, handball) and individual activities (walking, judo, capoeira; cycling, running, dancing, bowling, surfing, fishing, swimming, table tennis, court tennis, gymnastics, stretching / yoga, bodybuilding). It was adopted as classification criterion for collective activities, activities practiced in teams and opposition; and for individual activities, those that can be practiced individually.

Statistical analyses were carried out in the Stata SE statistical package, version 13. Statistical (absolute and relative frequency) and inferential statistics (gross and adjusted binary logistic regressions) stratified by gender were used. Two regression models were performed: first, odds ratio (OR) and 95% confidence intervals (95% CI) were obtained for the association between sociodemographic factors and involvement in fights among adolescents; second, for association between type of physical activity and involvement in fights. In the adjustment model of each analysis, the sociodemographic and alcohol consumption variables were simultaneously entered. The last variable was inserted in the analysis models because it presents as an important confounding factor in the relationships that are established with the involvement in fights. Adolescents who reported consuming any amount of alcoholic beverages in a typical week were considered exposed to alcohol.

The project was approved by the Human Research Ethics Committee of the Federal University of Santa Catarina under protocol No. 1029/2010.

## RESULTS

Of the total of 6,529 adolescents who participated in the study, 6,341 answered questions related to involvement in fights. The sociodemographic characteristics of participants were presented in a previously published study<sup>11</sup>. When sexes were compared, the involvement in fights was higher among boys (36.9; 95% CI: 34.7; 39.1) than among girls (26.0; 95% CI: 23.8; 28.4). The proportions of boys and girls who engaged in fights according to sociodemographic characteristics and practice of physical activity can be seen in Table 1.

**Table 1.** Prevalence of involvement in fights in the last 12 months, according to sex. Santa Catarina, 2011.

Variable	Boys			Girls		
	N	%	CI95%	N	%	CI95%
<b>Age</b>						
15-16 years	1630	39.0	36.2; 41.8	2209	27.0	24.2; 29.9
17-19 years	1273	33.9	30.4; 37.5	1417	24.5	22.0; 27.1
<b>Study shift</b>						
Day	1584	35.7	33.0; 38.4	2361	24.8	22.2; 27.6
Night	1319	39.5	35.9; 43.3	1265	30.3	27.1; 33.8
<b>Area of residence</b>						
Rural	684	32.0	28.1; 36.2	853	26.1	21.7; 30.9
Urban	2200	37.7	35.1; 40.4	2746	26.1	23.9; 28.5
<b>Lives alone or without family</b>						
No	60	51.3	36.6; 65.8	127	32.7	23.3; 43.6
Yes	2833	36.6	34.4; 38.8	3481	25.7	23.4; 28.2
<b>Work</b>						
No	1000	34.4	30.9; 38.1	1870	25.5	22.4; 28.8
Yes	1902	38.5	35.6; 41.4	1754	26.7	24.2; 29.5
<b>Income (minimum wages)*</b>						
Up to 2	719	35.9	31.8; 40.1	1436	28.1	24.2; 32.4
3 to 5	1469	35.7	32.3; 39.2	1698	24.6	22.1; 27.3
6 to 10	538	36.9	33.6; 40.3	368	23.0	17.5; 29.6
11 or more	152	49.4	37.7; 61.1	73	37.3	26.0; 50.2
<b>Types of PA</b>						
Do not practice PA	533	29.4	25.7; 33.5	1481	25.6	23.5; 27.9
Collective only	846	37.2	34.0; 40.6	288	22.6	18.1; 27.9
Individual only	558	34.0	30.2; 38.4	1349	26.2	23.9; 28.6
Collective and individual	951	42.8	39.7; 46.0	483	31.0	27.0; 35.3

Note: \* Gross family income in minimum wages (Reais). 95% CI (95% confidence interval)

In the analysis of sociodemographic variables associated to the involvement in fights in the last 12 months (Table 2), it was observed that in the

adjusted analysis, living in urban areas (OR: 1.45, 95% CI: 1.13, 1.87) and living alone (OR: 2.22, 95% CI: 1.22, 4.02) increased the chances of boys engaging in fights. As for girls, an increase in the chance of being involved in fights in the last 12 months was observed among those who attended high school during the night shift (OR: 1.26, 95% CI: 1.04, 1.52). Both boys (OR: 0.66; 95% CI: 0.55; 0.81) and girls (OR: 0.80; 95% CI: 0.68; 0.95) aged 17-19 were less likely of being involved in fights compared to those aged 15-16 years.

In analyzing the association between participation in different types of PA and involvement in fights in the last 12 months (Table 3), it was verified in the adjusted analysis that, among boys, the exclusive practice of collective PA (OR: 1.56, 95% CI: 1.13, 2.25), and collective and individual PA (OR: 1.91, 95% CI, 1.44, 2.54) was associated with involvement in fights. In girls, only the practice of collective and individual PA (OR: 1.36, 95% CI: 1.05, 1.76) was associated with involvement in fights.

**Table 2.** Crude and adjusted Odds Ratio (OR) and 95% confidence intervals for association between sociodemographic factors and involvement in fights in the last 12 months in adolescents. Santa Catarina, 2011.

Variables	Boys		Girls	
	Crude OR (95% CI)	Adjusted** OR (95% CI)	Crude OR (95% CI)	Adjusted** OR (95% CI)
<b>Age (years)</b>				
15-16	1.00	1.00	1.00	1.00
17-19	0.80 (0.66; 0.97)	0.66 (0.55; 0.81)	0.88 (0.75; 1.02)	0.80 (0.68; 0.95)
<b>Study shift</b>				
Day	1.00	1.00	1.00	1.00
Night	1.18 (0.97; 1.43)	1.11 (0.89; 1.39)	1.32 (1.07; 1.61)	1.26 (1.04; 1.52)
<b>Area of residence</b>				
Rural	1.00	1.00	1.00	1.00
Urban	1.29 (1.02; 1.62)	1.45 (1.13; 1.87)	1.00 (0.79; 1.26)	1.04 (0.82; 1.33)
<b>Lives alone or without family</b>				
No	1.00	1.00	1.00	1.00
Yes	1.82 (1.02; 3.27)	2.22 (1.22; 4.02)	1.40 (0.87; 2.26)	1.29 (0.76; 2.18)
<b>Work</b>				
No	1.00	1.00	1.00	1.00
Yes	1.19 (0.97; 1.47)	1.10 (0.87; 1.38)	1.12 (0.90; 1.39)	0.96 (0.79; 1.18)
<b>Income (minimum wages)*</b>				
Up to 2	1.00	1.00	1.00	1.00
3 to 5	0.99 (0.80; 1.23)	0.88 (0.71; 1.10)	0.83 (0.66; 1.05)	0.80 (0.64; 1.01)
6 to 10	1.05 (0.83; 1.33)	0.86 (0.69; 1.07)	0.76 (0.52; 1.11)	0.71 (0.48; 1.04)
11 or more	1.74 (1.04; 2.93)	1.38 (0.79; 2.40)	1.52 (0.91; 2.52)	1.40 (0.79; 2.47)

Note: \* Gross family income in minimum wages (Reais). \*\* Adjustment for all sociodemographic variables and alcohol consumption.

**Table 3.** Crude and adjusted odds ratio (or) and 95% confidence intervals for involvement in fights, comparing students participating in different types of PA to those who do not participate in PA (reference category). Santa Catarina, 2011.

Variables	Boys		Girls	
	Crude	Adjusted**	Crude	Adjusted**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Types of PA				
Do not practice PA	1.00	1.00	1.00	1.00
Collective only	1.52 (1.12; 2.06)	1.56 (1.13; 2.15)	0.83 (0.56; 1.22)	0.78 (0.53; 1.15)
Individual only	1.28 (0.92; 1.79)	1.34 (0.95; 1.88)	1.04 (0.76; 1.44)	1.06 (0.78; 1.43)
Collective and individual	1.84 (1.38; 2.45)	1.91 (1.44; 2.54)	1.37 (1.08; 1.74)	1.36 (1.05; 1.76)

Note: \* Wald test with significance level of 5%. \*\* Adjustment for all sociodemographic variables and alcohol consumption.

## DISCUSSION

The present study found that boys were more involved in fights in the last 12 months compared to girls. Adolescents aged 17-19 years are less likely of being involved in fights. Living in urban areas and not living with the family reflects an increase in the likelihood of being involved in fights among boys. In both sexes, the practice of collective physical activities was associated with involvement in fights in the last 12 months.

According to the findings of this study, the prevalence of involvement in fights was significantly higher among boys compared to girls, which corroborates other studies<sup>1,3</sup>. Violence is understood as a social construction<sup>13</sup>, transmitted by multiple systems present in life, such as family and school<sup>14</sup>. The greater involvement in fights in boys may be a reflection of the behavior of parents, since male children are educated towards virility and masculinity<sup>15</sup>. Although they follow developmental paths similar to boys, girls are less likely of adopting aggressive behaviors<sup>7</sup>, and express their aggressiveness indirectly, through anger and hostility<sup>16</sup>.

In the present study, boys living in urban areas and do not live with the family had a higher risk of being involved in fights. Similarly, the literature shows that living or studying in urban areas increases the chance of being involved in fights among adolescents<sup>6</sup>. It is known that children and adolescents belong to age groups most vulnerable to the outcomes related to urban violence<sup>17</sup>. Consequently, the urban environment can stimulate emotional and behavioral states propitious to the constitution of various forms of violence<sup>17</sup>. As for living with parents, it was observed in the National Survey of Students' Health<sup>8</sup>, that girls living with their parents were less likely of being involved in situations of physical violence, an association not verified in boys.

In both sexes, adolescents aged 17-19 years were less prone to aggressive behavior. A previous study involving adolescents aged 12-19 years found that the probability of getting involved in fights was higher in younger age groups<sup>4</sup>, and this situation may be associated with difficulties in dealing

with problems specific to this phase of life, such as the need to identify with some social group and being part of it<sup>18</sup>. On the other hand, as adolescents get older, some life-time responsibilities are more present, such as the closeness of the entrance exam and the insertion in the job market, retaining the students' attitudes and commitment to these events<sup>19</sup>. On the other hand, previous investigations did not find an association between the age of the adolescents and the report of fights<sup>5,6</sup>.

Girls enrolled in the night shift were more likely of being involved in fights. Future studies are needed to understand this relationship, as these girls probably work and are more likely of being exposed to stressful situations. In this study, family income and labor market insertion did not correlate with participation in fights in the last 12 months, corroborating another study<sup>5</sup>.

It was found that boys who participated in collective or individual activities and girls who participated in collective and individual activities were more likely of being engaged in fights. A similar result was found in another study<sup>20</sup> regarding the relationship between PA practice and aggressive behavior. It is believed that the greater involvement in fights is related to the competitive nature of activities, since competitiveness is one of the contents taught in collective modalities to students<sup>21</sup>, which can be unconsciously transmitted from practice to social life<sup>22</sup>.

It is important to consider that aggression can manifest itself in the context of sports practice<sup>23</sup>. The way in which sports are configured, as well as situations generated in sports practice may favor aggressive behaviors, such as aggression resulting from frustration experienced in a defeat or poor performance<sup>23</sup>. Therefore, teachers and coaches should supervise games, as they can influence young people not to behave so aggressively in game situations<sup>22</sup>.

In essence, the offer of sports practice is a strategy that assists in the process of socialization and the construction of citizenship, contributing to minimize violence and the construction of a culture of peace capable of promoting cooperation, teamwork and improvement of the human coexistence<sup>24</sup>. Although sport plays an important role in promoting a culture of peace, some intrinsic characteristics of sport practice may come in the opposite direction.

In this sense, it is emphasized the importance of the teacher / coach's performance in relation to aspects focused on human formation, for understanding that sports practice can be emancipatory, since its practitioners can experience values and characteristics strongly centered on rivalry, which disregards aspects such as responsibility, cooperation, respect, solidarity, etc. An action that considers human formation as important thinks of educational action as capable of promoting the actions of those involved in the co-creation of a desirable human space of social coexistence<sup>25</sup> and, therefore, does not stimulate fight. Researchers<sup>26</sup> report that in school, physical education should lead to the development of positive attitudes and behaviors appropriate to its practice.

In addition, it is necessary to emphasize the context in which school-children are inserted, being necessary the knowledge of the school and the reality of students, leading teachers to understand the needs related to their

actions. Thus, one of the educational challenges at present has been violence in school and, in turn, aggression among students and also of students towards teachers<sup>27</sup>. Physical education, in addition to being part of the school context, directly works with sports practice, and can be configured as a promoter of this negative scenario inside the school, especially when it excessively values competition and distancing from contents in relation to the world of students, as well as the absence of enriching methodological strategies that promote human values. The lack of consideration of the social reality in which the student is inserted usually promotes educational practice without meaning in the scope of the teaching process.

Although useful for the public health area, the results should be interpreted with caution, as there are some limitations. The sample is not representative of adolescents who do not attend school or are enrolled in private schools. The question applied to evaluate the involvement in fights referred to the occurrence of episodes of physical aggression in the last 12 months, which makes it impossible to identify periods of fights and makes the result more susceptible to memory bias. Moreover, the instrument applied did not include information on drug use, an important variable of confusion in established relationships, as well as other variables that make up the manifestation of violence, such as bullying, threats, among others; which would be limiting the understanding of the investigated phenomenon.

## CONCLUSIONS

The prevalence of boys engaged in physical aggression in the past 12 months was higher than that of girls. Boys aged 15-16 years who lived in urban areas and did not live with the family, as well as girls of the same age group enrolled in the night shift were more likely of being involved in fights. The practice of collective PA was presented as a risk to involvement in fights in both sexes. Violence prevention programs, especially in the school environment, play a fundamental role in social education, and should be encouraged mainly in urban areas, with greater focus on younger boys and adolescents. It is important that professional-oriented sport practices stimulate cooperation, respect for others and sportsmanship, so that healthy social interaction can occur in interpersonal relationships. It is suggested that future researches seek to identify which characteristics of the sports practice explain the involvement in fights, in order to favor the promotion of sports and the construction of a culture of peace.

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