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Time Trends and Socioeconomic Inequalities in Parental Physical Aggression and Adolescent Physical Fighting: Three Brazilian Birth Cohort Studies Over Twenty Years, 2000–2020

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A B S T R A C T

Purpose: Violence prevention requires robust data on trends in different forms of violence and measures of progress toward reduction across subgroups of the population. This study aimed to investigate trends and related socioeconomic inequalities in parental physical aggression and involvement in physical fights among adolescents.
Methods: Three population-based birth cohorts were conducted, including all births in the calendar years 1982, 1993, and 2004 in Pelotas city, Southern Brazil, with over 4,200 births in each cohort. Confidential self-report questionnaires were used to measure parental physical aggression (ages 11 and 15 years) and involvement in physical fights (ages 11, 15, and 18). The prevalence of violence outcomes was estimated, stratifying by sex and family income group for each cohort, and income-related inequalities were assessed through time.
Results: There were significant reductions in parental physical aggression between cohorts, at ages 11 (prevalence ratio (PR): 0.83) and 15 years (PR: 0.70), and there was some evidence of reductions in income-related inequality regarding harsh parenting, mainly for boys. Considering physical fighting, there was a small increase through time for boys at age 11 (PR: 1.22), but no change for either sex at age 15, and declines for girls at age 18 years (PR: 0.50). There were income inequalities in physical fighting for girls at ages 11 and 15 (with a higher prevalence among the poorest adolescent girls in comparison to the richest), which persisted through time. However, income inequality in fighting among girls at age 18 reduced through time. There was little income inequality in fighting among boys at any age in any cohort.

IMPLICATIONS AND CONTRIBUTION

There were significant reductions in parental physical aggression in population-based samples of adolescents in Southern Brazil over the past 2 decades, accompanied by reduced income inequalities. There was no evidence of reductions in physical fighting. These findings contribute to monitoring trends in a major health and social challenge in Brazil, highlighting the need for violence prevention efforts promoting adolescent health and well-

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Discussion: Encouraging declines in parental physical aggression have occurred over the past 2 decades in this population of adolescents, but there is less clear evidence of changes in physical fights. Continued monitoring is vital to inform violence prevention policies.

being that are sensitive to income inequalities in exposure to violence.

The World Health Organization has highlighted violence as a leading worldwide public health problem given its major consequences for health and care services everywhere and its detrimental effect on scarce resources for countries and communities [1,2]. Interpersonal violence, characterized as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation", is among the most important preventable causes of premature morbidity and mortality globally [3,4]. Rates of violence vary widely across the world, with the Latin America and Caribbean region presenting staggering and persistently high levels [5], where interpersonal violence is among the leading causes of disability-adjusted life years [6,7]. Brazil, where the current study was conducted, has the highest absolute number of deaths by interpersonal violence worldwide [8]. Since the 1980s in Brazil, violence has been a prominent cause of morbidity as well as mortality [9], and currently represents the leading cause of death among young people [10,11].

Adolescence is an important period of increased exposure to risky situations involving violence [12]. Maltreatment in the caregiving environment (abuse and neglect by parents and caregivers, most often in the home but also in settings such as schools) is one of the most significant forms of exposure to violence for children, with well-documented adverse consequences through the life-course [13]. Harsh parenting in general, including use of physical aggression in the context of discipline or punishment, is also considered a key risk factor for children's own development of aggression [14]. Community violence, occurring between individuals who may or may not know each other, and which generally takes place outside of the home, can take multiple forms including acts of bullying and physical fighting, and also more severe sexual and physical assault. Both being exposed to harsh or abusive parenting in the home, and involvement in community violence, such as physical fights, are highly prevalent during adolescence, and considered strongly intertwined, partly given several important co-occurring drivers (such as socioeconomic strain), as well as the key role that exposure to violence has for the development of risky and aggressive behaviors [15,16].

National studies confirm these are important and highly prevalent forms of violence experienced by Brazilian adolescents, and longitudinal research shows their interconnectedness in this context [17]. In 2019, data from the National School Survey (PeNSE) show that 21.0% of the students reported being physically assaulted by their mother, father, or guardian in the previous 12 months, while 10.1% engaged in a physical fight in the last 30 days [18]. An increasing trend of all types of violence experienced by adolescent students was also observed between 2009 and 2015—including being a victim of physical aggression by an adult in the family in the past month and involvement in fights with a firearm or other weapon [19]. Despite this evidence from PeNSE, few other comparable indicators are available to examine adolescent exposure to violence over longer time periods in Brazil. Given the major socioeconomic influences on violence, another important gap in knowledge is whether any trends in violence have occurred similarly for different sociodemographic groups [15]. Poverty is a strong risk factor for experiencing violence in the home and community and income [15] and economic support to improve economic security and stability are considered key strategies to prevent violence against children and between adolescents, as proposed by the World Health Organization and UNICEF in the international INSPIRE framework [20]. Thus, monitoring income inequalities in violence over time is important to understand if progress is being achieved especially across socioeconomic groups, to guide new prevention efforts.

Key international bodies consider global violence prevention to be a priority [15,21], and the 2030 Agenda for Sustainable Development advocates for the reduction of all forms of violence and related mortality [22,23]. Toward the end, monitoring trends in violence and how changes differ across subgroups of the population is of great importance to align with the principle of "leaving no one behind". The aim of the current study was to assess time trends in adolescent exposure to violence in the family and involvement in physical fights considering income-related inequalities and differences by sex, using data from 3 population-based birth cohort studies carried out in the city of Pelotas in southern Brazil over a 20-year period.

Methods

Research setting and study design

Pelotas is a medium-sized city in the state of Rio Grande do Sul, located in the south of Brazil. According to the Brazilian Institute of Geography and Statistics, the municipal population counts about 325,685 inhabitants [24]. Its population is predominantly urban (93.3%), and its main economic activities are commerce, education, and agriculture (especially rice production). More than 99% of all birth deliveries take place in hospitals in Pelotas. In 1982, 1993, and 2004, all women giving birth in one of the Pelotas hospitals and who were resident in the urban area of the city, were invited to participate in 3 population-based birth cohort studies with similar designs. Data were collected on 5,914, 5,245 and 4,231 live births in 1982, 1993 and 2004, respectively. Refusal rates at recruitment were 1.3% or less in all 3 cohorts [25]. Cohort children have been followed up at several time points since birth, and data collected on growth, morbidity, development, and feeding habits, as well as sociodemographic and family characteristics. Further details of the methods of the cohort studies are available elsewhere [26–30].

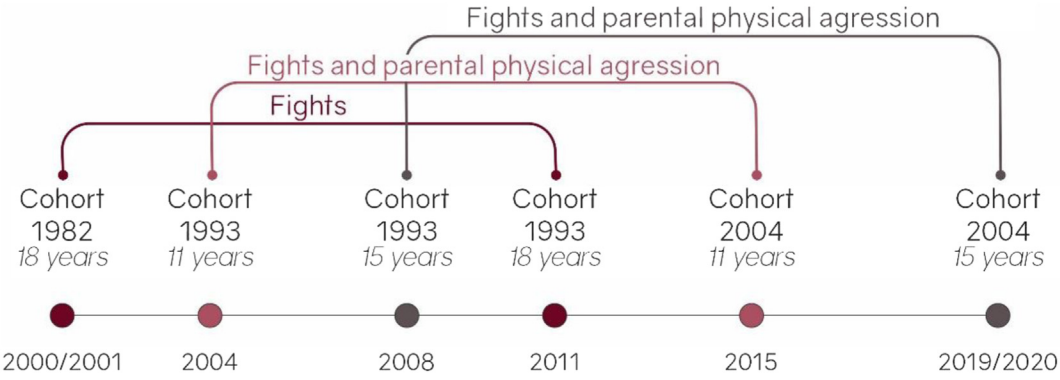

Figure 1. Timeline of follow-up waves of the 3 birth cohort studies, and comparisons made between them.

Figure 1 illustrates the timeline of follow-up waves of the 3 cohort studies and the comparisons made between them. The analyses reported in the present study refer to 11-year-old and 15-year-old follow-ups of the 1993 and 2004 cohorts (occurring in the years 2004 and 2008 for the 1993 cohort; and 2015 and 2019–2020 for the 2004 cohort) and the 18-year-old follow-up of the 1982 and 1993 cohorts (occurring in the years 2000–2001 for the 1982 cohort; and 2011 for the 1993 cohort).

Follow-up rates in the 1982 Cohort were 78.9% for boys and 69.0% for girls at age 18 years [30]. In the 1993 cohort, the follow-up rate at 11, 15, and 18 years was 87.5%, 85.7%, and 81.4%, respectively. And in the 2004 cohort, the response rate was 87% in the 11-year follow-up [23,26]. Due to the COVID-19 pandemic, the fieldwork of the 15-year follow-up of the 2004 cohort was interrupted halfway through and thus included a subsample of the entire cohort (N = 1,949), the total follow-up (including these and 102 accumulated deaths in the cohort, as per all past descriptions of the study) was 48.5% [31].

Parental physical aggression and adolescent involvements in physical fights

The same or similar questions about violence were asked across each cohort at similar ages. At ages 11 and 15, participants in the 1993 and 2004 cohorts were asked about the experience of being hit by parents and involvement in physical fights through the following questions: "*Have you ever been hit at home by your parents in your life? How many times in the past 6 months?*" The Brazilian Portuguese term asked about in these questions (*apanhar*) is a broad term that could encompass being hit, kicked, slapped, punched, hurt with an object, or other forms of physical aggression by parents, which could range from relatively less severe acts such as smacking to spanking. As such, we specify this construct as "parental physical aggression" in this article, coded present if adolescents reported they had been hit by parents at least once in the past 6 months. In the same confidential assessments at ages 11 and 15 in the 1993 and 2004 cohorts, adolescents were asked *"In the last year, did you get into a fight where someone was hurt?"*. Additionally, in the 1982 and 1993 cohorts, the following question was asked at age 18 "*In the last year, did you participate in a fight which involved physical aggression?*". All positive answers are referred to as involved in physical fights in this article.

Socioeconomic and demographic information

The following socioeconomic and demographic characteristics were measured during the perinatal (birth) assessment in each cohort study: sex, maternal age, maternal schooling (assessed as the number of completed years of formal education), marital status (single or living with partner), and household family income (collected in local currency and categorized into quintiles; Q1 representing the poorest 20% and Q5 the wealthiest 20%). Self-reported adolescent skin color (white, brown, or black) was assessed when adolescents were 11 years old.

Statistical analyses

The analyses were performed using the Stata Statistical Software, version 15.1 (Stata Corp., College Station, USA). The number of twins in the cohorts was small (less than 2%) and did not pose a clustering problem; therefore, twins were retained in the analyzed sample.

Chi-square tests were used to compare the distributions of categorical socioeconomic and demographic characteristics between cohorts. As the intervals among the 3 cohorts are equal (11 years each), we tested for linear trends. We estimated the total prevalence of interpersonal violence outcomes for each cohort at respective follow-up waves (11, 15, and 18 years). Absolute and relative changes in the prevalence of each outcome considering the younger and oldest cohort time point were used to assess time trends. To calculate crude and age-adjusted risk ratios, we used Poisson regression with robust standard errors [32]. The Wald test was used to assess trends.

To assess socioeconomic inequalities, time trends in each type of violence were additionally estimated according to family income groups at birth (quintiles). First, the prevalence of the outcome was estimated for each family income group and the absolute differences between groups were illustrated in a clear and simple way using the Equiplot graphs (www.equidade.org/equiplot). To quantify the magnitude of income-related inequalities in violence in these cohorts, 2 wealth-based inequality measures were estimated, the slope index of inequality (SII) and the concentration index (CIX) [33]. They were constructed using individual-level income data reported on by caregivers. This data was categorized into quintiles of family income in the cohort. Both SII and CIX are then calculated on the distribution of the outcomes across the 5 wealth quintiles. The SII is a measure of absolute socioeconomic inequality and represents the difference between the prevalence of violence

for the extremes of the family income distribution, estimated through a logistic regression [33]. The CIX is a measure of relative inequality analogous to the Gini index and estimates the concentration of a given attribute (in the current study adolescent interpersonal violence outcomes) toward the poorest or the richest [33]. Both measures are expressed on a scale from −100 to +100, in which zero represents perfect equality. A positive value would indicate that the prevalence of violence is higher among the wealthier while a negative value would indicate that the prevalence is concentrated toward the poorer. Absolute and relative measures are considered complementary approaches in the assessment of inequalities over time [34].

Interactions by sex were tested, comparing the prevalence of each violence indicator across cohorts. Because some of them were significant *($p < .01$ considered significant for interactions)*, we present results stratified by sex. Significant interactions were fights at 11 years ($p = .012$) and fights at 18 years (0.001).

All follow-up waves were approved by the Ethics Committee of the Federal University of Pelotas, School of Medicine. In the 3 cohort studies, after being informed of the details of the study, both mothers and adolescents gave informed consent to be involved in the study. In the 18-year follow-up of the 1982 and 1993 cohorts because the participants reached the legal age of responsibility, mothers' consent was no longer necessary. Further details on the methods of each cohort are available in previous publications [25,27–29].

Results

Table 1 shows characteristics of the mothers when cohort participants were born, in each study. Between 1982 and 2004, the proportion of mothers with 9 and 11 years of schooling increased from 11.1% to 33.0%, and the proportion of mothers not living with a partner increased from 8.2% to 16.4%. As for maternal age, there was an increase in the proportion of adolescent mothers, aged between 12 and 19 years old (15.4%–18%), as well as those aged 35 years or older (9.9%–13.3%). *The proportion of adolescents with white skin color decreased from 75.4% to 68.2% across the cohorts.*

Time trends in adolescent experiences of interpersonal violence are reported in Table 2 (for boys) and Table 3 (for girls). For boys, there was a significant decrease in exposure to parental physical aggression both at ages 11 (2004–2015) and 15 (2008–2020)—absolute reductions were 7.1 and 6.2 percentage points, respectively. Relative risk reductions in harsh parenting over time were 17.0% (Adjusted Ratio T2/T1 = 0.83; $p < .001$) and 30.0% (Ratio T2/T1 = 0.70; $p < .001$) across time at these ages. For girls, there were also significant reductions in parental physical aggression at ages 11 years (2004–2015) and 15 years (2008–2020)—absolute reductions of 11.2 percentage points and 5.3 percentage points, respectively. Relative risk reductions were 36.0% and 26.0% for each period.

Regarding involvement in physical fights, for boys (Table 2) there was a significant overall increase through time at age 11 (between 2004 and 2015) from 17.1% to 20.3%, with an n-adjusted relative change of 22%. However, no significant changes were observed for boys' involvement in fights at ages 15 or 18 years. Among girls, at age 18 years, there was a significant absolute reduction in fights (4.8 percentage points) between 2000 and 2011, with a 50% reduction in terms of relative risk (Table 3). No significant changes were observed in girls' involvement in fights at ages 11 and 15 years.

Trends in income-related inequalities in parental physical aggression and involvement in physical fights are presented in

Table 1
Sociodemographic characteristics of participants in the 3 Pelotas Birth Cohort Studies (born 1982, 1993, 2004)

	Pelotas birth cohort, n (%)			*p*
	1982	1993	2004	
Sex				0.059
Male	3,037 (51.4)	2,603 (49.6)	2,195 (51.9)	
Female	2,876 (48.6)	2,645 (50.4)	2,036 (48.1)	
Adolescent skin color				<0.001
White	3,238 (75.4)	2,769 (64.1)	2,726 (68.2)	
Brown	385 (8.9)	943 (21.8)	482 (12.0)	
Black	673 (15.7)	611 (14.1)	790 (19.8)	
Maternal age (years)				<0.001
12–19	912 (15.4)	915 (17.4)	799 (18.0)	
20–24	1,843 (31.2)	1,447 (27.6)	1,148 (27.1)	
25–29	1,599 (27.0)	1,353 (25.7)	959 (22.7)	
30–34	973 (16.5)	956 (18.2)	758 (17.9)	
≥35	586 (9.9)	577 (11.0)	563 (13.3)	
Maternal schooling (years)				<0.001
<4	1,282 (21.7)	832 (15.9)	347 (8.3)	
4–8	3,132 (53.0)	3,060 (58.4)	2,038 (48.7)	
9–11	654 (11.1)	923 (17.6)	1,381 (33.0)	
≥12	839 (14.2)	427 (8.2)	420 (10.0)	
Marital status				<0.001
Not living with a partner	485 (8.2)	649 (12.4)	693 (16.4)	
With partner	5,424 (91.8)	4,600 (87.6)	3,536 (83.6)	
Family income (quintiles)				<0.001
Q1 (poorest)	1,183 (20.0)	1,031 (20.1)	872 (20.6)	
Q2	2,178 (19.9)	1,195 (23.3)	855 (20.2)	
Q3	1,180 (20.0)	889 (17.3)	816 (19.3)	
Q4	1,185 (20.0)	1,001 (19.5)	858 (20.3)	
Q5 (richest)	1,188 (20.1)	1,021 (19.9)	830 (19.6)	

p value of the Chi-square test for the linear trend comparing 1982, 1993, and 2004 birth cohorts.

Table 2
Time trends in interpersonal adolescent violence in *male subjects* from 3 birth cohort studies in Brazil over 20 years (2000–2020)

Age	Cohorts compared Cohort 1–Cohort 2	Years compared Time 1–time 2	Violence outcomes	Prevalence time 1 (%)	Prevalence time 2 (%)	Absolute difference T2-T1	Ratio T2/ T1	*p* value	Ratio T2/T1 Adjusted[a]	*p* value[b]
18 years	1982–1993	2000–2011	Involvement in Fights	15.7	17.1	1.4	1.08	.236	1.00	.691
15 years	1993–2004	2008–2020	Involvement in Fights	16.4	14.4	−2.0	0.88	.160	0.84	.206
			Parental aggression	22.7	16.5	−6.2	0.73	<.001	0.70	<.001
11 years	1993–2004	2004–2015	Involvement in Fights	17.1	20.3	3.2	1.19	.008	1.22	.027
			Parental aggression	44.2	37.1	−7.1	0.84	<.001	0.83	<.001

[a] Relative increase in risk of violence comparing Time 2 (younger cohort) to Time one (older cohort), adjusted for age at assessment (in months).
[b] *p* value of relative change.

Figure 2, for boys and girls separately. Parental physical aggression at ages 11 and 15 was more common among adolescents in poorer families compared to the richest families, for both boys and girls, and at all time points (see also Tables S1 and S2). However, income-related inequalities in harsh parenting reduced over time for both boys and girls, with most notable reductions at age 15—more details on these results can be found in Supplementary Table S1 and Table S2. Considering physical fights, no significant differences were observed by income group for boys—for all ages analyzed across each year of study (Table S1). However, for girls, several changes in inequalities were observed. First, the significant inequality in physical fights for girls at age 11 (higher among the poorest girls in comparison to the richest), increased over time (2004–2015), which was mainly driven by larger increases in fighting among the poorest 20%. Second, considering physical fights for girls at age 15, there was a slight increase in both absolute and relative income–related inequalities from 2008 to 2020 (Table S2). Third, physical fights at age 18 were more common among poorer girls than richer girls (15.6% in Q1 vs. 6.2% in Q5), in the year 2000, but inequalities then reduced over time such that by 2011, there was no difference in rates between the poorest and wealthiest groups (Table S2). This reflected a significant reduction in physical fights at age 18 among girls pertaining to the lower 2 quintiles of family income (the 40% poorest) from 2000 to 2011.

Discussion

We report on trends in 2 types of interpersonal violence commonly experienced by adolescents, namely parental physical aggression and involvement in physical fights, in the city of Pelotas, Southern Brazil, in 3 population-based cohort studies following about 15,000 adolescents since they were born in 1982, 1993 and 2004. The study covers a period of 20 years (2000-2020) reflecting a time of rapid and important transformations in Brazilian society. We found significant reductions in the prevalence of parental physical aggression over time for both boys and girls. Importantly, these reductions were accompanied by the narrowing of income-related inequalities, whereby previously higher rates of parental physical aggression among poorer families compared to richer families, were reduced. Trends for involvement in physical fights were not as pronounced as for harsh parenting and differed between girls and boys. For boys, there was a slight increase through time in physical fighting measured at age 11 years. While a reduction in physical fights was found for girls at age 18 years, this was not observed for boys. For girls, income inequalities in physical fighting (higher prevalence among poorer girls) increased at ages 11 and 15, but reduced for fights measured at age 18. Among boys, involvement in physical fights was similar across all income groups and no changes were observed over time.

Our findings indicate a decrease in parental physical aggression experienced by adolescents in this population in the past 2 decades, which is encouraging and likely to reflect, among other factors, the progress made on child protection legislation/rights in the country [35]. In 2001, for example, the notification of child and adolescent cases of maltreatment became mandatory across all institutions of the Unified Health System in Brazil, and the Ministry of Health implemented specific guidance for health professionals to follow a standard protocol when reporting cases [35]. More recently, in 2014, another landmark was the enactment of the “Menino Bernardo” law which consolidated “the right of children and adolescents to be educated and cared for without the use of physical punishment or cruel or degrading treatment”. This means that beatings, humiliations, or any other form of physical or psychological violence should not be used in educational or care settings, ensuring the development and well-being of children and adolescents [36]. Besides legal advances, important improvements in parents’ education and other socioeconomic indicators linked to parental physical aggression have occurred during the study period which may have had a role in these time trends [25]. We emphasize that the current

Table 3
Time trends in interpersonal adolescent violence in *female subjects* from 3 birth cohort studies in Brazil, over 20 years (2000–2020)

Age	Cohorts compared Cohort 1–Cohort 2	Years compared Time 1–time 2	Violence outcomes	Prevalence time 1 (%)	Prevalence time 2 (%)	Absolute difference T2-T1	Ratio T2/ T1	*p* value	Ratio T2/T1 Adjusted[a]	*p*[b]
18 years	1982–1993	2000–2011	Involvement in Fights	10.7	5.9	−4.8	0.55	<.001	0.50	<0.001
15 years	1993–2004	2008–2020	Involvement in Fights	8.0	6.5	−1.5	0.81	.155	0.79	0.219
			Parental aggression	22.2	16.9	−5.3	0.76	.001	0.74	0.001
11 years	1993–2004	2004–2015	Involvement in Fights	6.2	7.2	1.0	1.16	.203	1.12	0.390
			Parental aggression	40.3	29.1	−11.2	0.72	<.001	0.64	<0.001

[a] Relative increase in risk of violence comparing Time 2 (younger cohort) to Time one (older cohort), adjusted for age at assessment (in months).
[b] *p*-value of relative change.

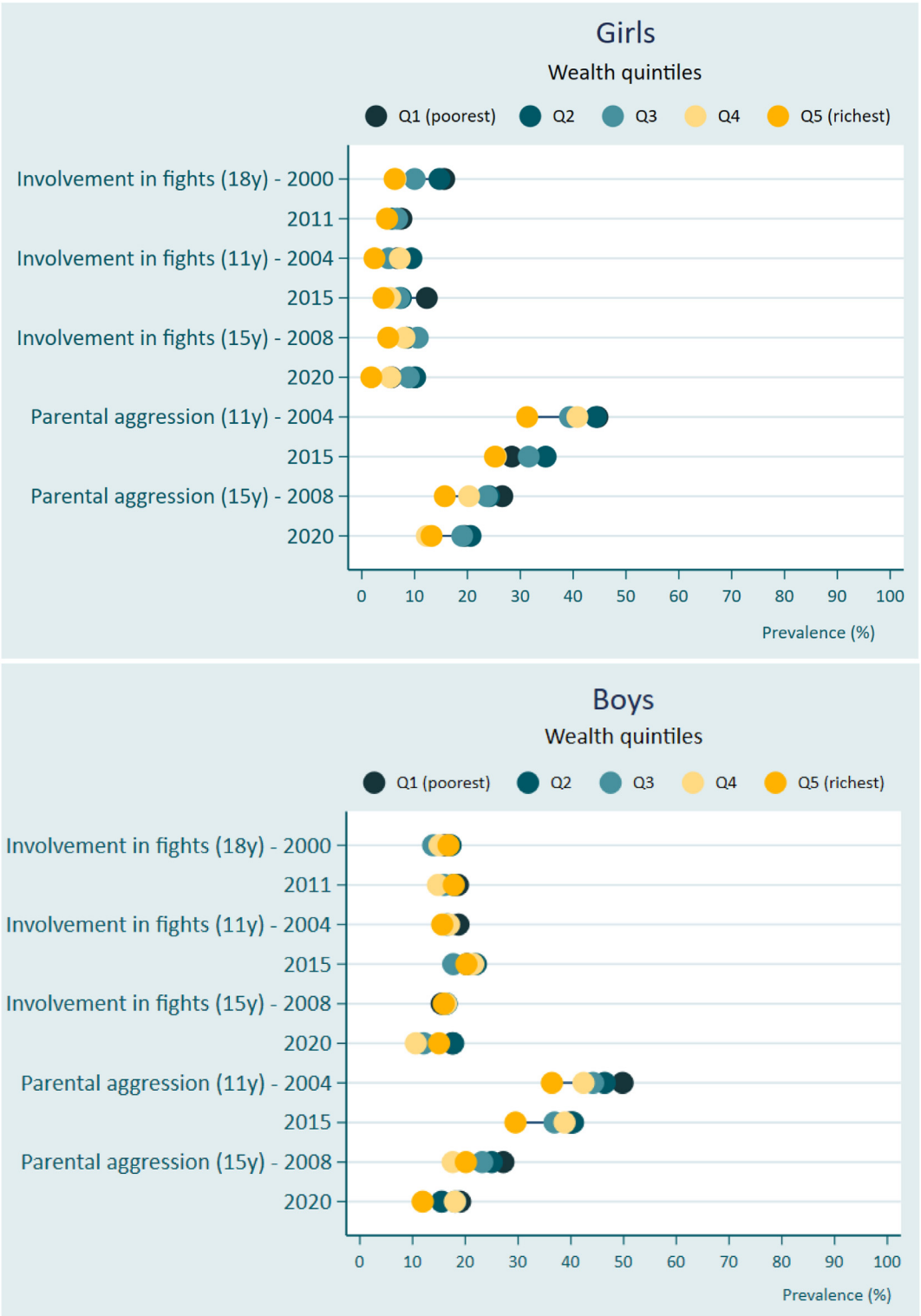

Figure 2. Prevalence of parental physical aggression and involvement in physical fights among adolescents in relation to family income quintiles in boys and girls from 3 birth cohort studies in Brazil over 20 years (2000–2020).

study does not include data testing causal mechanisms, so explanations for the observed time trends are speculative and require further research.

Despite significant reductions in parental physical aggression found in this study, it is important to note that prevalence rates are still very high, particularly among younger adolescents, with

one in 3 female adolescents and nearly 40% of male adolescents reporting experiencing parental physical aggression at home at age 11, in 2015. In addition, marked income-related inequalities continue to exist (e.g., at 11 years in 2015 the prevalence among the poorest boys was 40% in comparison to 29.5% among the richest). Given the well-known adverse consequences of child maltreatment, including links with impaired mental health [37] and child emotional and conduct problems [17] as documented in this specific population, increased investment in the implementation and improvement of public policy strategies to prevent child maltreatment including harsh parenting is urgently needed. Child maltreatment has also been identified as a risk factor for participation in later violence [38] both in international studies [39] and in the local study population [40]. Other forms of harsh parenting examined in the current study have also linked with the development of child conduct problems and later violence, both in international studies [14] and the current study population [17,41].

Contrary to our findings of decreasing parental physical aggression through time, data from the school-based Brazilian national survey (PeNSE), show an increasing trend in corporal punishment at home between 2009 and 2015, among students aged 13–17 years [20]. Potential reasons for this difference include: the current study specifically asked about physical aggression perpetrated by parents while PeNSE asked about any adult in the home; PeNSE asked about physical injury, which may reflect more severe physical abuse, than the question in our survey about being hit. We cover a broader time period, starting in the early 2000s; we included younger adolescents who reported more parental physical aggression at age 11 years. The national survey was also conducted in state capitals while our study covers only one noncapital city in Southern Brazil.

We found a small increase in physical fights among male adolescents aged 11 (from 17.1% to 20.3%), a pattern observed across all income groups, and there was no decrease in fights measured at ages 15 and 18. The importance of the decrease observed in this study at age 11 is unclear, as, even though it was statistically significant, the magnitude of effect was small (3.2% absolute decrease). However, data from the national PeNSE study do point to a rising trend in involvement in fights with firearms/melee weapon for most capitals from 2009 to 2015, with boys and students attending public schools presenting the highest mean increases [20]. With interpersonal violence the leading cause of death in Brazil [11], evidence of increases in indicators of aggression and low perceived safety among adolescents is of particular concern [42]. The causes of overall increases in serious violence in Brazil in recent decades are not entirely clear, given many health and socioeconomic indicators have improved, but time trends in homicide rates have been understood as strongly related to changes in gang-dynamics and national and international drugs trades [43]. Notwithstanding this picture regarding male-driven violence in Brazil, the decreases in rates of fighting among girls aged 18 observed in the current study are positive, and in line with reductions in risk behaviors such as drug and tobacco use also observed in this population [44].

The Pelotas Birth Cohorts are rigorous observational population-based studies that share location, methods, and recruitment strategy, and thus enable us to draw a very precise picture of trends over 20 years. Compared to the PenSE, which is conducted in schools, an advantage of the current study is that it comprises the general population of adolescents, including those not attending schools, which may influence violence outcomes. Another major strength of our study is the collection of comparable data over time over 3 large prospective studies that are well matched in terms of design, ages at follow-up, and high rates of follow-up. Nevertheless, some limitations of the current study need to be considered for accurate interpretation of the findings. The violence outcomes investigated are based on youth self-reports of their experiences. As such, it is possible that some adolescents underreported or over-reported their experiences of harsh parenting at home or involvement in fighting. However, violence indicators were assessed through self-applied confidential questionnaires at ages 11 and 15, after obtaining participant informed consent, which are considered essential aspects of violence data collection, given the sensitivity nature of the topic (e.g., to mitigate participant distress and improve disclosure). Another limitation is that information on the place of occurrence was not established regarding physical fights. Therefore, it is possible that some adolescents were reporting on fights that took place in the home environment instead of the community or on the way to school where they often occur. It should also be highlighted that data on other forms of violence that are common in adolescence were missing in the cohorts (e.g., sexual victimization, bullying, and dating violence). Therefore, the current study is not intended to provide a complete figure of all violent situations experienced by adolescents. Finally, it is important to highlight that the data presented here were collected in one city in the south of Brazil are not necessarily representative of the country.

Although structural racism is a significant influence on the experience of violence in Brazil, ethnic inequalities were not analyzed in the current study. The topic is complex and should be explored in detailed work on racial inequality and different types of violence, using specialized literature and analyses adjusted for confounding variables, so it was not considered appropriate to further examine ethnic inequalities within the current analyses.

Conclusions

Violence is a complex multicausal phenomenon that is, in general, strongly associated with social and economic inequalities. The cohort studies analyzed here span a period of rapid transformation in Brazilian society, with notable positive trends concerning reductions in poverty, increases in parental education, and major improvements in health indicators [28]. Overall, our findings suggest that, for adolescents in general, and also across varied income levels, parental physical aggression has declined significantly; however, physical fighting has been generally stable or shown some increase over an 11-year period for young male adolescents, regretfully. Although income-related inequalities in some violence indicators have reduced, disparities associated with family wealth continue to exist and are sizable, with poorer adolescents standing out as those most affected by parental physical aggression (both girls and boys) and involvement in physical fights (for girls). It was notable that adolescent male involvement in fights did not differ by family income groups in this study, indicating the importance of other influences on male physical fights in this developmental period.

Importantly, we recognize that the relationship between inequality and interpersonal violence is bidirectional: while reductions in economic inequality may contribute to a decline in certain forms of violence, such as harsh parenting, violence itself can perpetuate and exacerbate existing inequalities across communities. These findings underscore the need for multifaceted

violence prevention policies that promote the health and well-being of adolescents, particularly those most at risk, by addressing both broad social determinants and implementing targeted strategies to reduce violence and associated inequalities.

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Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2025.01.019

References

[1] Krug EG, Mercy JA, Dahlberg LL, et al. The world report on violence and health. Lancet 2002;360:1083–8.
[2] World Health Assembly, 49. Prevention of violence: Public health priority. World Health Organization. 1996. Available at: https://iris.who.int/handle/10665/179463. Accessed February 12, 2025.
[3] World Health Organization. World report on violence and health. WHO Library Cataloguing-in-Publication. 2002. Available at: https://www.who.int/publications/i/item/9241545615. Accessed October 3, 2024.
[4] Fazel S, Smith EN, Chang Z, et al. Risk factors for interpersonal violence: An umbrella review of meta-analyses. Br J Psychiatr 2018;213:609–14.
[5] Chioda L. Stop the violence in Latin America: A Look at prevention from Cradle to adulthood. 2017. Available at: http://hdl.handle.net/10986/25920. Accessed October 3, 2024.
[6] Murray CJ, Barber RM, Foreman KJ, et al. Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990-2013: Quantifying the epidemiological transition. Lancet 2015;386:2145–91.
[7] Silva AAM. Monitoring trends in socioeconomic, maternal and child health inequalities. Int J Epidemiol 2019;48:i1i3.
[8] Murray J, Cerqueira DR, Kahn T. Crime and violence in Brazil: Systematic review of time trends, prevalence rates and risk factors. Aggress Violent Behav 2013;18:471–83.
[9] Souza ER, Lima MLC. Panorama da violência urbana no Brasil e suas capitais. Ciência Saúde Coletiva 2006;11:1211–22.
[10] Institute for Health Metric and Evaluation. Global Burden of Disease 2019 Institute for Health Metrics and Evaluation. 2022. Available at: https://ghdx.healthdata.org/gbd-results-tool. Accessed February 12, 2025.
[11] Esposti MD, Coll CV, Murray J, et al. The leading causes of death in children and adolescents in Brazil, 2000-2020. Am J Prev Med 2023;65:716–20.
[12] Poton WL, Soares ALG, Gonçalves H. Problemas de comportamento internalizantes e externalizantes e uso de substâncias na adolescência. Cad Saúde Pública 2018;34:e00205917.
[13] Norman RE, Byambaa M, De R, et al. The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. PLoS Med 2012;9:e1001349.
[14] Eisner M, Malti T. The development of aggressive behavior and violence. 2015:795–884.
[15] World Health Organization. Global status report on preventing violence against children 2020: Executive summary. Geneva: World Health Organization; 2020.
[16] United Nations Children's Fund. Preventing and Responding to violence against children and adolescents. New York: United Nations Children's Fund; 2017.
[17] Bauer A, Fairchild G, Halligan SL, et al. Harsh parenting and child conduct and emotional problems: Parent- and child-effects in the 2004 Pelotas birth cohort. Eur Child Adolesc Psychiatry 2021;31:1–11.
[18] Malta DC, Andrade FMD, Ferreira ACM, et al. Prevalência de exposição às situações REME Revista Mineira de Enfermagem. Available at: https://pe.uf.b/em.php/ré/artigo/visualizar/38624. Accessed September 4, 2024.
[19] Pinto IV, Barufaldi LA, Campos MO, et al. Trends in violent situations experienced by Brazilian adolescents: National adolescent student health survey 2009, 2012, and 2015. Rev Bras Epidemiol 2018;21(suppl 1):e180014.
[20] INSPIRE Handbook: Action for implementing the seven strategies for ending violence against children. Geneva: World Health Organization; 2018. Licence: CC BY-NC-SA 3.0 IGO.
[21] United Nations Children's Fund. Hidden in plain Sight: A statistical analysis of violence against children. 2014. New York. 2014. Available at: http://www.who.int/violence_injury_prevention/violence/status_report/2014/data/en/. Accessed September 4, 2024.
[22] United Nations. Transforming our world: The 2030 agenda for sustainable development. New York. 2015. Available at: https://sdgs.un.org/2030agenda. Accessed September 4, 2024.
[23] United Nations Office on Drug and Crime. Global study on homicide: Trends, contexts, data. In: Vienna, editor. United Nations Office on Drugs and Crime. Available at: https://www.unodc.org/documents/congress/background-information/Crime_Statistics/Global_Study_on_Homicide_2011.pdf. Accessed May 5, 2024.
[24] Instituto Brasileiro de Geografia e Estatística (IBGE). Panorama do Censo 2022. Disponível em. Available at: https://censo2022.ibge.gov.br/panorama/. Accessed September 4, 2024.
[25] Bertoldi AD, Barros FC, Hallal PRC, et al. Trends and inequalities in maternal and child health in a Brazilian city: Methodology and sociodemographic description of four population-based birth cohort studies, 1982-2015. Int J Epidemiol 2019;48:i4–15.
[26] Barros AJD, Santos IS, Matijasevich A, et al. Methods used in the 1982, 1993, and 2004 birth cohort studies from Pelotas, Rio Grande do Sul State, Brazil, and a description of the socioeconomic conditions of participants' families. J Cadernos de Saúde Pública 2008;24:s371–80.
[27] Santos IS, Barros AJ, Matijasevich A, et al. Cohort profile: The 2004 Pelotas (Brazil) birth cohort study. Int J Epidemiol 2011;40:1461–8.
[28] Victora CG, Barros FC. Cohort profile: The 1982 Pelotas (Brazil) birth cohort study. Int J Epidemiol 2006;35:237–42.
[29] Victora CG, Hallal PC, Araujo CL, et al. Cohort profile: The 1993 Pelotas (Brazil) birth cohort study. Int J Epidemiol 2008;37:704–9.
[30] Victora CG, Barros FC, Lima RC, et al. The Pelotas birth cohort study, Rio Grande do Sul, Brazil, 1982-2001. J Cadernos de Saúde Pública 2003;19:1241–56.
[31] Tovo-Rodrigues L, Santos IS, Bierhals IO, et al. Cohort profile update: 2004 Pelotas (Brazil) birth cohort study follow-up during adolescence. Int J Epidemiol 2024;53:dyad156.
[32] Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: An empirical comparison of models that directly estimate the prevalence ratio. BMC Med Res Methodol 2003;3:21.
[33] Barros AJ, Victora CG. Measuring coverage in MNCH: Determining and interpreting inequalities in coverage of maternal, newborn, and child health interventions. PLoS Med 2013;10:e1001390.
[34] Silva ICM, Restrepo-Mendez MC, Costa JC, et al. Mensuração de desigualdades sociais em saúde: conceitos e abordagens metodológicas no contexto brasileiro. Epidemiol Serv Saúde 2018;27:e000100017.
[35] de Martins CBG, de Jorge MHPM. Maus-tratos infantis: um resgate da história e das políticas de proteção. Acta Paul Enferm 2010;23:423–8.
[36] Trindade AA, Hohendorff JV. Efetivação da Lei Menino Bernardo pelas redes de proteção e de atendimento a crianças e adolescentes. Cad Saúde Pública 2020;36:e00193919.
[37] Gallo EAG, De Mola CL, Wehrmeister F, et al. Childhood maltreatment preceding depressive disorder at age 18 years: A prospective Brazilian birth cohort study. J Affect Disord 2017;217:218–24.
[38] Widom CS. The cycle of violence. Science 1989;244:160–6.
[39] Duke NN, Pettingell SL, McMorris BJ, et al. Adolescent violence perpetration: Associations with multiple types of adverse childhood experiences. Pediatrics 2010;125:e778–86.
[40] Bauer A, Martins RC, Hammerton G, et al. Adverse childhood experiences and crime outcomes in early adulthood: A multi-method approach in a Brazilian birth cohort. Psychiatr Res 2024;334:115809.

[41] Murray J, Menezes AMB, Hickman M, et al. Childhood behaviour problems predict crime and violence in late adolescence: Brazilian and British birth cohort studies. Soc Psychiatr Psychiatr Epidemiol 2015;50:579–89.
[42] Malta DA-O, Minayo MA-O, Cardoso LA-O, et al. Mortality among Brazilian adolescents and young adults between 1990 to 2019: An analysis of the global burden of disease study. Ciên Saúde Colet 2021;26:4069–86.
[43] Feltran G, Lero C, Cipriani M, et al. Variações nas taxas de homicídios no Brasil: Uma explicação centrada nos conflitos faccionais. Dilemas Rev Estud Conflito Controle Soc 2022;15:313.
[44] Arroyave LJO, Restrepo-Méndez MC, Horta BL, et al. Tendências e desigualdades nos comportamentos de risco em adolescentes: comparação das coortes de nascimentos de Pelotas, Rio Grande do Sul, Brasil. Cad Saúde Pública 2016;32:e00120215.