

Sociodemographic factors and lifestyle behaviours associated with bullying victimization and perpetration in a sample of Brazilian adolescents

Fatores sociodemográficos e comportamentos de estilo de vida associados à vitimização e perpetração do *bullying* em uma amostra de adolescentes brasileiros

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Abstract *This article aims to identify the association of sociodemographic factors and lifestyle behaviours with bullying perpetration and victimization among high school students. The adolescents (n=852) answered a questionnaire about bullying (victims and perpetrators), socio-demographic factors (sex, age, maternal education, and participant's work status), tobacco use, alcohol use, illicit drug experimentation, physical activity, screen time, and sleep duration. Multi-level logistic regression models were performed. Older adolescents were less likely to be victims of bullying. Females were less likely to be perpetrators or victims of bullying. Adolescents who were working were more likely to be involved in bullying in both forms. Participation in non-sport activities and alcohol consumption were associated with higher odds of bullying victimization. We have identified specific populational subgroups that are more susceptible to being victims and/or perpetrators of bullying, which could support tailor-specific interventions to prevent bullying.*

Key words *Bullying, Adolescent Health, Schools, Lifestyle behaviours, Social behaviour*

Resumo *O objetivo deste artigo é identificar a associação de fatores sociodemográficos e comportamentos de estilo de vida com a perpetração do bullying e da vitimização entre os alunos do ensino médio. Os adolescentes (n=852) responderam a um questionário sobre bullying (vítimas e perpetradores), fatores sociodemográficos (sexo, idade, educação materna e status profissional dos participantes), uso de tabaco, uso de álcool, experimentação de drogas ilícitas, atividade física, tempo de tela e duração do sono. Modelos de regressão logística multinível foram realizados. Os adolescentes mais velhos eram menos propensos a serem vítimas de bullying. As mulheres tinham menos probabilidade de serem perpetradoras ou vítimas de bullying. Os adolescentes que estavam trabalhando tinham maior probabilidade de estarem envolvidos em bullying em ambas as formas. A participação em atividades não esportivas e o consumo de álcool estavam associados a maiores probabilidades de vitimização por bullying. Identificamos subgrupos populacionais específicos que são mais suscetíveis a serem vítimas e/ou perpetradores de bullying, o que poderia apoiar intervenções específicas sob medida para evitar o bullying.*

Palavras-chave *Bullying, Saúde do Adolescente, Escolas, Comportamentos de estilo de vida, Comportamento social*

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Introduction

In recent years, bullying has been internationally recognized as a public health problem among young populations that may increase the risk of health, social, and educational problems during childhood and adolescence¹. Characterized by repeated physical or verbal harassment involving an imbalance of power between the aggressor and the victim², where it covers a wide range of types, frequencies, and levels of aggression, from teasing and name-calling to physical, verbal, and social abuse intended to harm other individuals^{3,4}. Epidemiological research shows that, on average, 26-30% of schoolchildren worldwide are involved in at least one bullying situation, playing the role of perpetrator, victim, or victim and perpetrator simultaneously^{5,6}. However, a report by the United Nations Educational, Scientific and Cultural Organization showed that there is substantial regional variation in the prevalence of bullying worldwide, ranging from 22.8% in Central America, 25.0% and 31.7% in Europe and North America respectively, and 30.2% in South America⁷. There is also significant geographic variation between low- and middle-income countries compared to high-income countries, thus requiring further exploratory research to identify their particularities⁸.

According to the literature, the perpetration of bullying is the result of aggressive physical or verbal behavior against other individuals without necessarily being provoked^{9,10}. However, bullying victimization refers to individuals who have suffered intentional and repeated victimization that places them in a power imbalance with their aggressor^{9,11}. Such behaviors can lead to short- and long-term health-related consequences for those involved as a result of lifelong bullying determined by multiple factors, such as socio-demographic (e.g., gender, age, and income) and lifestyle characteristics (e.g., physical activity, screen time, and substance use). Although the effects of participation in bullying are similar, the incidence of bullying can vary depending on the role played by individuals (perpetrators and/or victims)^{12,13}.

Previous studies have shown that youth's socio-demographic and lifestyle characteristics may differ according to their role in bullying^{14,15}. Data from the Global School-based Student Health Survey show that the global prevalence of bullying is 30.4% among girls and 34.8% among boys aged 13-15⁷, other studies have shown that men are more likely than women to be victims and/or

perpetrators of traditional bullying^{11,16}. It is also observed that bullying can vary with age, reaching a peak in early adolescence when bullying can be misused to strengthen or improve one's social status¹⁰. A systematic review observed that bullying and age have a curvilinear pattern of correlations, i.e., the chances of bullying steadily increases until age 14, after that age, the likelihood of bullying from and among peers decreases¹⁷. However, other characteristics (e.g. maternal education and having and/or having a job) related to family income have been little explored in studies with South American adolescents, as some adolescents may need to help contribute to the family income, according to data from the International Labor Organization and the United Nations Children's Fund, more than eight million children are working in Latin America and the Caribbean alone¹⁸. Therefore, investigating the interactions between sociodemographic variables and bullying may be necessary in understanding the behaviors.

Moreover, lifestyle characteristics were associated with distinct roles in bullying situations. The importance of a healthy lifestyle is widely advocated in developed nations, where it is commonly perceived that the demands of modern life often exceed people's ability to deal with them¹⁹. According to World Health Organization, lifestyle is a set of habits and customs that are influenced, modified, encouraged or inhibited by the prolonged process of socialization²⁰. From this perspective, a multicenter study with data from 82 countries shows that lifestyle behaviors may predict bullying behaviors in adolescents from low- and middle-income countries⁸. For example, the likelihood of bullying victimization is higher among adolescents such as insomniacs and loners, who use alcohol and tobacco, and spend high amounts of time in front of screens^{21,22}.

In contrast, adolescents who play the role of the perpetrator were more likely to have sleep disturbances and involved in substance abuse (e.g., tobacco, alcohol, and drugs), have low school performance and not meet physical activity guidelines^{23,24}. We emphasize that the epidemiological studies carried out in Brazil did not include behavioral variables (e.g., sleep, screen behavior, and physical activity) within their conceptual models, thus requiring further studies on the possible impacts of bullying on these behaviors^{15,25}. The relationship between physical activity and bullying may arise from the contextual characteristics of physical activity practice²⁶. Exposure to distinct types of activities, particularly

comparing non-sports with sports activities, may influence youth to engage in prosocial²⁶ or aggressive behaviours²⁷, respectively. Thus involvement in bullying situations may be influenced by the context in which different types of physical activity are practiced. However, the direction of these associations remains to be explored in underrepresented populations such as low- and middle-income countries²⁸.

In this direction, knowing factors related to bullying enables early identification of children more likely to aggress their peers. This aspect is fundamental in that it helps in the design of interventions that focus on reducing bullying, fostering a school environment conducive to learning, and preventing future violent behaviour^{10,17}. Few studies have investigated factors associated with bullying victimization and perpetration jointly in low- and middle-income countries, and the scenario of Latin American countries is underrepresented in the scientific literature^{8,14}. Therefore, this study aimed to identify the association of sociodemographic factors and lifestyle behaviours with bullying perpetration and victimization among high school students.

Methods

Study design and population

This study utilized cross-sectional data from the baseline sample of the Longitudinal Study of the Lifestyle of Adolescents (ELEVA). Further information regarding ELEVA can be found on the study's official website (<https://eleva.ufsc.br/en/>). The ELEVA study aimed to investigate lifestyle factors and health outcomes among public high school students that offered integrated courses with professional college-level programs within the mesoregion of Grande Florianópolis, located in southern Brazil. Three suitable schools affiliated with the Federal Institutes of Technological Education of Santa Catarina (IFSC) were identified and included in the study. Baseline data collection took place between August and December 2019. A census approach was employed, wherein all students present in the schools during the data collection period were deemed eligible and were invited to participate in the study. Consent forms were given to those who wished to participate, and they were required to obtain consent from their parents or legal guardians. After these steps, 1,010 of the 1,618 eligible students returned the signed forms and were able to participate in the

study. The project was approved by the Ethics Committee in Research with Human Beings of the Universidade Federal de Santa Catarina (protocol number: 3,168,745).

Measurements

The variables used in the present study were measured using an online questionnaire hosted on the SurveyMonkey® platform, which could be answered using students' electronic devices or those provided by the researchers. The average response time was 24 minutes. The complete questionnaire is available online (<https://eleva.ufsc.br/en/>).

To assess information related to bullying, students answered two questions. The first, related to bullying victimization, was as follows: "In the last 30 days, how often have any of your classmates ridiculed, mocked, made fun of, intimidated, or teased you to such an extent that you were hurt, bothered, upset, offended, or humiliated?" The five possible responses indicated on a Likert-like scale (ranging from never to always) were dichotomized as yes (rarely, sometimes, frequently, and always) or no (never). The second question, related to bullying perpetration, was as follows: "In the last 30 days, have you punched, scoffed, mocked, bullied, or teased one of your schoolmates so much that he was hurt, upset, offended, or humiliated?" There were two possible responses: yes or no. These questions were based on the Brazilian National School-based Health Survey (PeNSE) and have been used in previous research on Brazilian adolescents^{15,25,29}. Reliability was tested in the pilot sample of the ELEVA study (n=100 [complete case analysis]; 68% girls; 16.3±0.99 years old). Gwet's Agreement Coefficients were 0.79 and 0.78 for the questions on bullying victimization and bullying perpetration, respectively.

Furthermore, the socio-demographic factors of sex (male and female), age (full years), mother's education (incomplete elementary school [0-8 years], elementary school [8-10 years], high school [at least 11 years], college [at least graduated], or unknown), and participants' work status (yes or no) were assessed.

The following questions were used to assess alcohol use, tobacco smoking, and illicit drug experimentation, respectively: "During the past 30 days, on how many days did you have at least one drink containing alcohol?", "During the last 30 days, how many days have you smoked cigarettes?", "Have you ever used a drug like marijuana

na, cocaine, crack, ecstasy, etc.?” For alcohol use and tobacco smoking, participants were coded as “No” or “At least once in the past 30 days”. Original responses of “No” or “Yes” were considered for illicit drug experimentation. These questions were originally from the Global School-based Student Health Survey³⁰.

Physical activity was assessed using an adapted version of the Self-administered Physical Activity Checklist³¹, which has been validated for Brazilian adolescents³². It consists of the following question: “In general, which of the following activities do you engage in? Please state how many days in a normal week and for how long each day you engage in any of the activities”. Participants indicated the frequency (0-7 days/week) and duration (min) of 22 activities. The volume of sports was calculated by summing the volume of soccer, futsal, basketball, handball, volleyball, tennis, table tennis, swimming, athletics, combat sports, gymnastics, cycling, skating, and surfing³³. Non-sports were coded as the sum of the volume of capoeira, dancing, collective fitness sessions (e.g., aerobics and functional training), walking, jogging, and active play. Previous studies have also used this categorization³⁴.

Screen time was assessed using the Questionnaire for Screen Time of Adolescents (QueST), validated for Brazilian adolescents³⁵. This questionnaire is composed of items related to five activities regardless of the device used to perform them (e.g., computer, television, smartphone): studying, working, watching videos (e.g., series, news, movies), playing video games, and using social media or chat applications. Students reported the time in hours they performed each activity on weekdays and weekends. To obtain the daily volume of each screen time indicator, the following formula was used: [volume on weekdays*5 + volume on weekends*2]/7). This approach has been employed in previous studies^{34,36}.

Sleep duration was calculated as the difference between self-reported bedtimes and wake-up times on weekdays and weekends. Implausible sleep duration values were detected through data inspection (<1 or >20 hours, n=3) and were excluded. To obtain the daily volume of sleep duration, the following formula was used: [(volume on weekdays *5 + volume on weekend days*2)/7]. This procedure has previously been employed^{34,36}.

Statistical analysis

Participants’ characteristics were described using means and standard deviations for contin-

uous variables and absolute and relative frequencies for categorical variables. Multilevel binary logistic regression models were performed to analyze the association of socio-demographic and lifestyle behaviours with bullying victimization and perpetration. All exposure variables were simultaneously included in both models, one for each bullying outcome. The clustering structure of the data, with students (level 1) nested within schools (level 2), was considered by including a random intercept for schools. The results were expressed as odds ratios (OR) and their respective 95% confidence intervals (95%CI). All statistical analyses were performed in Stata version 15 (Stata Corp., College Station, Texas, USA).

Results

Of the 1,010 participants, 852 had complete data for all variables in this study (Table 1). Around half of the sample reported being female (50.2%), and the mean age was 16.4±1.1 years. The proportion of participants whose parents had at least college or university degree was 42.1% and 19.6% of the participants reported working. Approximately 45% of students reported being a victim of bullying in the 30 days before data collection, and approximately 10% reported being a perpetrator of bullying in the same period. Regarding substance use, alcohol consumption was the most prevalent (43.3%), followed by illicit drug experimentation (20.2%) and smoking (8.2%). The participants spent approximately more than 12 hours per day in screen time and practiced an average of 2h per day in sports and non-sports activities, respectively.

The associations between socioeconomic factors and lifestyle behaviours with bullying are presented in Table 2. Age was associated with lower odds of bullying victimization (OR=0.77; 95%CI: 0.67-0.89). Being female was associated with both lower odds of bullying perpetration (OR=0.52; 95%CI: 0.31-0.88) and of bullying victimization (OR=0.66; 95%CI: 0.49-0.89). Students who were currently working were more likely to be perpetrators (OR=1.80; 95%CI: 1.03-3.13) and victims of bullying (OR=1.67; 95%CI: 1.16-2.41). Among the lifestyle behaviours, engaging in non-sport activities (OR=1.04; 95%CI: 1.00-1.09) and consuming alcohol (OR=1.39; 95%CI: 1.02-1.90) were associated with higher odds of bullying victimization. No associations were observed for smoking, illicit drug experimentation, screen time, and sleep duration.

Table 1. Sample characteristics (n=852, Santa Catarina, Brazil, 2019).

Variables	Mean	±SD
Age (years)	16.4	±1.1
Sport (h/day)	2.1	±3.8
Non-Sport (h/day)	2.5	±3.7
Screen Time (h/day)	12.3	±8.7
Sleep duration (h/day)	8.0	±1.3
Variables	n	%
Sex		
Male	424	49.8
Female	428	50.2
Maternal Education		
Incomplete elementary school	83	9.7
Elementary school	73	8.6
High school	311	36.5
College	359	42.1
Currently Working		
No	685	80.4
Yes	167	19.6
Alcohol Consumption		
No	483	56.7
Yes	369	43.3
Tobacco Smoking		
No	781	91.8
Yes	70	8.2
Illicit drugs Experimentation		
No	680	79.8
Yes	172	20.2
Bullying Perpetration		
No	770	90.4
Yes	82	9.6
Bullying Victimization		
No	479	56.2
Yes	373	43.8

Source: Authors.

Discussion

This study examined the association of socio-economic factors and lifestyle behaviours with involvement in bullying situations among Brazilian adolescents. Noteworthy is that almost half (45%) of the high school students reported being a victim of bullying, and this victimization was higher in specific subgroups. Our results showed that sex and working status were associated with bullying perpetration and victimization, while age and non-sport activities were associated with bullying victimization. These results demonstrate that these groups are more susceptible to involve-

ment in bullying situations and may benefit from specific interventions.

In the present study we investigated population subgroups that may be more exposed to bullying and observed associations based on sex, age, and work. With regard to age, the observed association is similar to those reported in other studies; possibly older adolescents were less likely to be victims of bullying in the present study. This result is supported by other studies in the literature, which indicate that victimization decreases with advancing age^{11,15}. One possible explanation is that as students mature, they become more adept at self-defense because of the development of physical, cognitive, and social skills³⁷. Thus, they develop more adequate strategies to deal with the aggressive situations to which they may be exposed³⁸. In relation to sex, we observed that females were less likely to be involved in bullying situations than their male counterparts. This result has also been reported in other studies^{9,15,25}. According to the authors, cultural differences in the formation and social development between males and females may influence such behaviour, regardless of their role⁽³⁹⁾. However, males tend to engage in bullying through direct physical means, while females focus more on rumors, nicknames, or exclusion from social groups^{39,40}. Another point that can explain this difference is that males are in a phase in which the competition for status and search for prestige among females increases considerably, causing them to assume risky behaviours⁴¹. Based on this, strategies are suggested for behaviour change focusing on developing strategies to improve the conviviality, sense of belonging, protection, and a sense of responsibility among those involved that can mitigate such actions^{42,43}.

Our results show that work status was associated with bullying perpetration and victimization, which corroborates other studies conducted with Brazilian adolescents^{15,25}. This can be linked to socioeconomic issues, which generate the need for adolescents to contribute to the family income²⁵. The period of adolescence is related to constructing social relationships with peers, and entering the labor market during this time can interrupt or reduce the chances of developing social and communication skills at the same pace as their peers⁴⁴. Consequently, some problems can occur, such as peer discrimination and even violent behaviour arising from this exclusion²⁵.

Concerning substance use and involvement in bullying situations, our results showed that victims of bullying were more likely to be alcohol

Table 2. Associations of socioeconomic factors and lifestyle behaviours with bullying among high school students (n=852). Santa Catarina, Brazil, 2019.

Variables	Bullying perpetration		Bullying victimization	
	OR	95%CI	OR	95%CI
Age (years)	0.86	0.69-1.09	0.77	0.67-0.89
Sex				
Male	Ref.	Ref.	Ref.	Ref.
Female	0.52	0.31-0.88	0.66	0.49-0.89
Maternal Education				
Incomplete elementary school	Ref.	Ref.	Ref.	Ref.
Elementary school	2.14	0.72-6.39	1.09	0.57-2.12
High school	1.64	0.65-4.16	0.93	0.56-1.55
College	1.25	0.49-3.21	0.88	0.53-1.46
Currently working				
No	Ref.	Ref.	Ref.	Ref.
Yes	1.80	1.03-3.13	1.67	1.16-2.41
Lifestyle behaviours				
Tobacco Smoking				
No	Ref.	Ref.	Ref.	Ref.
Yes	2.13	0.85-5.29	1.09	0.60-1.98
Alcohol Consumption				
No	Ref.	Ref.	Ref.	Ref.
Yes	1.13	0.68-1.88	1.39	1.02-1.90
Illicit drugs Experimentation				
No	Ref.	Ref.	Ref.	Ref.
Yes	0.73	0.33-1.58	1.19	0.77-1.83
Sport	1.01	0.95-1.08	1.00	0.96-1.05
Non-sport	0.97	0.90-1.04	1.04	1.00-1.09
Screen Time	1.01	0.99-1.04	1.01	0.99-1.03
Sleep duration	0.89	0.75-1.07	0.98	0.88-1.09

Source: Authors.

users. This corroborates the findings of previous studies^{22,45,46}. Previous evidence showed that adolescents involved in any bullying experience, regardless of the role played, had a higher chance of developing risk behaviours, including substance use (e.g., alcohol, tobacco, and cannabis)^{47,48}. Another study of 44,532 high school adolescents in Florida reported that engaging in any bullying behaviour resulted in a high risk of alcohol consumption⁴⁹. Studies conducted with Brazilian schoolchildren showed an association between bullying victimization and alcohol use during elementary school, which corroborates our findings, which showed that such behaviour is maintained during high school^{15,50}. Although present in the literature, the association between bullying and substance use in adolescence is lacking in Latin American countries^{12,25,47}. Furthermore, identifying and promoting actions to reduce sub-

stance use during adolescence may help decrease future risk behaviours.

We did not find an association between sports practice and bullying perpetration and victimization, contrasting with the literature findings. For instance, a study showed that the practice of non-competitive physical activities is an excellent means for the transmission of values and helps to promote prosocial attitudes; thus, it can help prevent and treat bullying and victimization and in ensuring a lower risk of developing aggressive and deviant behaviours²⁶. Other studies reported an increase in aggressiveness associated with participation in sports^{27,43}. Evidence from other studies suggests that the amount of physical activity performed and the type of sport practiced can act as regulators in bullying victimization^{26,28}. On the other hand, we found that adolescents who practiced non-sports physical activities were

more likely to be victims of bullying than their peers. Some factors may underpin this relationship, such as (a) bullying victimization occurs frequently in activities not closely supervised, and therefore youth tend to avoid these activities²⁴, and (b) being overweight, having educational needs, and/or and/or low self-confidence to engage in physical activities²⁴ may increase the risk of being bullied during physical education classes²⁶. Thus, the adolescents who choose to engage in non-sportive physical activities may be those who do not have adult/teacher supervision and/or lack well-developed motor skills to practice sports that require more complex movement coordination and/or puts them in a position of conflict or competition⁵¹. However, this hypothesis needs to be tested in future studies. Furthermore, the cross-sectional design meant we were unable to confirm whether the adolescents were bullied for practicing non-sport physical activities or if they practiced non-sport physical activities because they were bullied while practicing sports.

Overall, the results of the present study suggest that a large proportion of students in the high school integrated with professional degrees has experienced bullying either as a victim and/or as a perpetrator, with some subgroups being more likely to have either outcome. This result is alarming, as it suggests that youth may be experiencing negative social relations and being exposed to its consequences for health. Bullying has been observed in other countries and settings as well, but particularly in Brazil, it may be related to broader social problems such as the health and social inequalities⁵², and the culture of violence⁵³, which may affect individuals in different degrees. Major societal changes are unlikely to happen in short spans of time. Thus, intervention, policies, and changes in services provided to adolescents are needed not only to prevent bullying, but also to help those afflicted by it to cope and heal. It was beyond the scope of the present study to identify where or when bullying happened. Still, it is important that adolescents feel welcomed and experience empathy from teachers, family, coaches, health professionals, and peers. Previous interventions, or those which encompass all members of the target population, regardless of risk for bullying, have shown not only positive results for youth, but also for those implementing the interventions, including increased prosocial behaviours, positive school climate, and positive interactions between peers, families, and school

staff⁵⁴. For children who are exposed to trauma, expert interventions can take shape in sports, as shown by the *Bounce Back League* program⁵⁵, where staff were trained to deliver sports activities in a fun and empowering environment, aiming to improve health outcomes and contribute to healing from trauma. In addition, other forms of sport or physical activity interventions have also shown successful results in improving life skills⁵⁶, reduce aggressiveness⁴³, and contribute to youth as citizens⁵⁷. Lastly, counseling and other forms of heal services provided by professionals should also be provided to youth, as barriers such as costs and wait times still need to be improved even in high-income countries⁵⁸.

In this study, the lifestyle was delimited solely to the individual behaviors chosen by adolescents. However, the personal risk approach tends to favor those from more privileged socioeconomic backgrounds, with higher levels of education and easier access to consumer goods, and it fails to consider the subjective dimension and the socio-historical context in which these individuals are embedded⁵⁹.

All variables analyzed in this study were self-reported by participants, thus allowing for different interpretations of bullying behaviours and other variables, since such measures are subject to memory biases and social desirability on the part of participants. This is especially true for bullying perpetration and substance use, which may be underreported among students. However, all variables were obtained from instruments adapted and validated in the pediatric population. The strengths of this study include that it investigated the different social roles identified among those involved in bullying, contributing to further clarifying the negative impacts both roles exert on adolescent health. Furthermore, this is a cross-sectional study, which offers a circumstantial perception of reality and does not allow for establishing a cause-and-effect relationship. Longitudinal research with the same variables is needed to investigate the direction of any of the associations. Finally, it should be noted that the scope of the current study was constrained to students who were enrolled in public high schools offering integrated programs with professional degrees at the college level within the mesoregion of Grande Florianópolis. As such, the generalizability of the findings may be limited by the specific social, cultural, and environmental attributes of the local context, thereby restricting their applicability to other settings.

Conclusion

The results of the present study indicate that specific population subgroups are more susceptible to being victims and/or perpetrators of bullying. Sociodemographic factors, such as gender and work, were positively associated with both those who bully and victims of bullying, respectively. In addition, associations were observed between age, non-sport activity, and alcohol consumption with

bullying victimization. These results support the development of targeted actions and public initiatives to protect young people, considering their specific subgroups. These initiatives should prioritize health promotion, protection, integrity, and intersectionality, as bullying can have detrimental effects on both physical and mental health. Collaborative efforts from educators, health professionals, parents, and the community are crucial for addressing this issue comprehensively.

Collaborations

All authors of this research paper participated directly in the planning, execution, and/or analysis of the study.

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