




**GENDER AND VULNERABILITIES IN ADOLESCENCE: COMPARATIVE ANALYSIS
OF HEALTH AND EDUCATION INDICATORS AMONG STUDENTS IN FORTALEZA
(2009–2019)**

**GÊNERO E VULNERABILIDADES NA ADOLESCÊNCIA: ANÁLISE COMPARATIVA
DE INDICADORES DE SAÚDE E EDUCAÇÃO ENTRE ESTUDANTES DE
FORTALEZA (2009–2019)**

**GÉNERO Y VULNERABILIDADES EN LA ADOLESCENCIA: ANÁLISIS
COMPARATIVO DE INDICADORES DE SALUD Y EDUCACIÓN ENTRE
ESTUDIANTES DE FORTALEZA (2009-2019)**

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ABSTRACT

This study conducted a comparative analysis, by sex, of the temporal evolution of indicators across the thematic areas of violent behavior, exposure to violence, mental health, access to services, and the school environment among adolescents in Fortaleza, from 2009 to 2019, based on data from the National School Health Survey (PeNSE). A quantitative approach was used, with proportion analysis and linear trend tests ($p < 0.05$). Among boys, early sexual initiation decreased from 36.5% to 29.8% (-18.3%), and among girls, from 16.8% to 14.6% (-13.1%). Condom use declined in both sexes: boys (-11.0%) and girls (-11.7%). Involvement in physical fights also decreased (boys -13.7%; girls -16.7%). Mental health showed signs of deterioration, with an increase in reports of loneliness (boys +40.2%; girls +26.4%). The use of health services increased, especially among boys (+13.6%). School-based sexuality education increased in both groups, with a higher prevalence among girls. The study concludes that boys exhibit more risk behaviors, while girls show greater emotional distress. The data indicate progress in educational policies but also highlight the urgent need for strategies that are more sensitive to gender differences. Cross-sectoral policies such as the Health at School Program should be strengthened and adapted to the specific

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needs of each group. Continuous monitoring of these indicators is essential to guide more effective actions.

Keywords: Adolescence. Gender. School health. Public policies. Fortaleza.

RESUMO

Este estudo analisou comparativamente, por sexo, a evolução temporal dos indicadores das áreas temáticas comportamento violento, exposição à violência, saúde mental, acesso a serviços e ambiente escolar entre adolescentes de Fortaleza, de 2009 a 2019, com base nos dados da Pesquisa Nacional de Saúde do Escolar (PeNSE). Utilizou-se abordagem quantitativa, com análise de proporções e testes de tendência linear ($p < 0,05$). Entre os meninos, a iniciação sexual precoce caiu de 36,5% para 29,8% (-18,3%), e entre as meninas, de 16,8% para 14,6% (-13,1%). O uso de preservativos caiu em ambos os sexos: meninos (-11,0%) e meninas (-11,7%). O envolvimento em brigas físicas também teve redução (meninos -13,7%; meninas -16,7%). A saúde mental mostrou deterioração, com crescimento de relatos de solidão (meninos +40,2%; meninas +26,4%). A procura por serviços de saúde aumentou, sobretudo entre os meninos (+13,6%). A orientação sobre sexualidade na escola cresceu em ambos os grupos, com prevalência maior entre as meninas. Conclui-se que os meninos apresentam mais comportamentos de risco, enquanto as meninas demonstram maior sofrimento emocional. Os dados indicam avanços nas políticas educativas, mas também apontam a necessidade urgente de estratégias mais sensíveis às diferenças de gênero. Políticas intersetoriais como o Programa Saúde na Escola devem ser reforçadas e adaptadas às especificidades dos grupos. O monitoramento contínuo desses indicadores é essencial para orientar ações mais eficazes.

Palavras-chave: Adolescência. Gênero. Saúde escolar. Políticas públicas. Fortaleza.

RESUMEN

Este estudio analizó comparativamente, por sexo, la evolución temporal de los indicadores en las áreas temáticas de comportamiento violento, exposición a la violencia, salud mental, acceso a servicios y entorno escolar en adolescentes de Fortaleza, entre 2009 y 2019, con base en datos de la Encuesta Nacional de Salud Escolar (PeNSE). Se empleó un enfoque cuantitativo, con análisis de proporciones y pruebas de tendencia lineal ($p < 0,05$). Entre los niños, la iniciación sexual temprana disminuyó del 36,5% al 29,8% (-18,3%), y entre las niñas, del 16,8% al 14,6% (-13,1%). El uso del preservativo disminuyó en ambos sexos: niños (-11,0%) y niñas (-11,7%). La participación en peleas físicas también disminuyó (niños -13,7%; niñas -16,7%). La salud mental mostró un deterioro, con un aumento en los reportes de soledad (niños +40,2%; niñas +26,4%). La demanda de servicios de salud aumentó, especialmente entre los niños (+13,6%). La orientación sobre sexualidad en las escuelas aumentó en ambos grupos, con una mayor prevalencia entre las niñas. Se concluyó que los niños presentan más conductas de riesgo, mientras que las niñas presentan mayor malestar emocional. Los datos indican avances en las políticas educativas, pero también señalan la urgente necesidad de estrategias más sensibles a las diferencias de género. Es necesario fortalecer las políticas intersectoriales, como el Programa de Salud en las



Escuelas, y adaptarlas a las especificidades de los grupos. El seguimiento continuo de estos indicadores es esencial para orientar acciones más eficaces.

Palabras clave: Adolescencia. Género. Salud escolar. Políticas públicas. Fortaleza.



INTRODUCTION

Gender inequalities during adolescence are manifested significantly in health indicators and school environment. Boys and girls experience adolescence under different social expectations, which is reflected in risk behaviors, access to information, experiences of violence and mental health (Alencar and Cantera, 2012; Bonfanti and Gomes, 2018; Freire, 2019; Caldas *et al.*, 2021; Marciano and Richartz, 2024). Understanding these differences is essential for planning effective and equitable public policies.

The National School Health Survey (PeNSE), periodically applied by the IBGE, provides a robust basis for intersectional analyses of health and education data (Penna, 2010; Olive tree *et al.*, 2017; (Ibge), 2021). This article aims to comparatively analyze, by sex, the indicators of the following thematic areas: violent behavior, exposure to violence, mental health, access to services and school environment among adolescents in the 9th grade of schools in Fortaleza, between 2009 and 2019.

METHODOLOGY

This is a descriptive, comparative, and time-series study, based on PeNSE microdata (2009, 2012, 2015, 2019). The target population was 9th grade students in Fortaleza, Ceará. The thematic areas analyzed were: (1) violent behaviors, (2) exposure to violence, (3) mental health and access to services, (4) school environment and educational policies.

Stratified analysis by sex (male and female) and by year was used, with calculation of proportions and percentage variations. The changes were tested for statistical significance by logistic regression, with $p < 0.05$. The variables were weighted according to the sample weights provided by the IBGE.

As the data are in the public domain and anonymized, it was not necessary to submit to the Research Ethics Committee, according to CNS Resolution No. 510/2016.

RESULTS

In the area of violent behaviors, the proportion of adolescents who reported early sexual initiation (<13 years) fell between 2009 and 2019. Among boys, there was a reduction from 36.5% to 29.8% (-18.3%), while among girls, the reduction was from 16.8% to 14.6% (-13.1%). These results show an important advance in awareness

campaigns, but still indicate that boys continue to start their sexual lives earlier, possibly due to cultural norms that encourage early masculinity. Condom use in the last sexual intercourse, although still relatively high, decreased in both sexes. Among boys, the proportion fell from 69.1% in 2009 to 61.5% in 2019 (-11.0%), and among girls, from 63.2% to 55.8% (-11.7%). This drop reflects the need to reinforce campaigns that encourage protected sex practices, especially among girls, who already have lower adherence.

Involvement in physical fights has also decreased. Among boys, the proportion fell from 15.3% to 13.2% (-13.7%), while among girls the reduction was greater, from 10.2% to 8.5% (-16.7%). These results indicate advances in conflict mediation policies and school safety, but the numbers still show that boys are more often involved in fights.

In the field of mental health, the frequency of reported loneliness increased in both sexes. Among boys, the increase was from 8.7% in 2009 to 12.2% in 2019 (+40.2%), while among girls, it rose from 16.3% to 20.6% (+26.4%). This increase may reflect increased mental health awareness and greater willingness to report feelings, but it also indicates a scenario of greater psychological distress, especially among girls.

The demand for health services increased in both sexes. Among boys, the rate grew from 42.5% to 48.3% (+13.6%), while among girls the increase was from 48.1% to 51.7% (+7.5%). This demonstrates greater access to health services, but may also be related to the increase in emotional and psychological demands of this age group.

The proportion of adolescents who reported having received sexual orientation at school increased in both sexes. Among boys, the proportion rose from 82.4% to 87.2% (+5.8%), while among girls it increased from 85.6% to 88.3% (+3.2%). These results indicate advances in educational policies and greater coverage of the School Health Program (PSE), but also show that there is still room to improve the scope of these actions.

Table 1 - Indicators of Indicators of the thematic areas: 1. Violent Behaviors, 2. Violent Behavior and Exposure to Violence, 3. Mental Health and Access to Services, 4. School Environment and Educational Policies, from the National Surveys of School Health, of adolescent students in Fortaleza by sex (2009-2019). Fortaleza/CE, 2024.

Thematic Area	Indicator	Year	Male (%)	Female (%)	Difference % (Male)	Difference % (Female)
Violent behaviors	Early sexual initiation (<13 years)	2009	36,5	16,8	-	-
		2019	29,8	14,6	-18,3	-13,1
	Condom use	2009	69,1	63,2	-	-
		2019	61,5	55,8	-11,0	-11,7

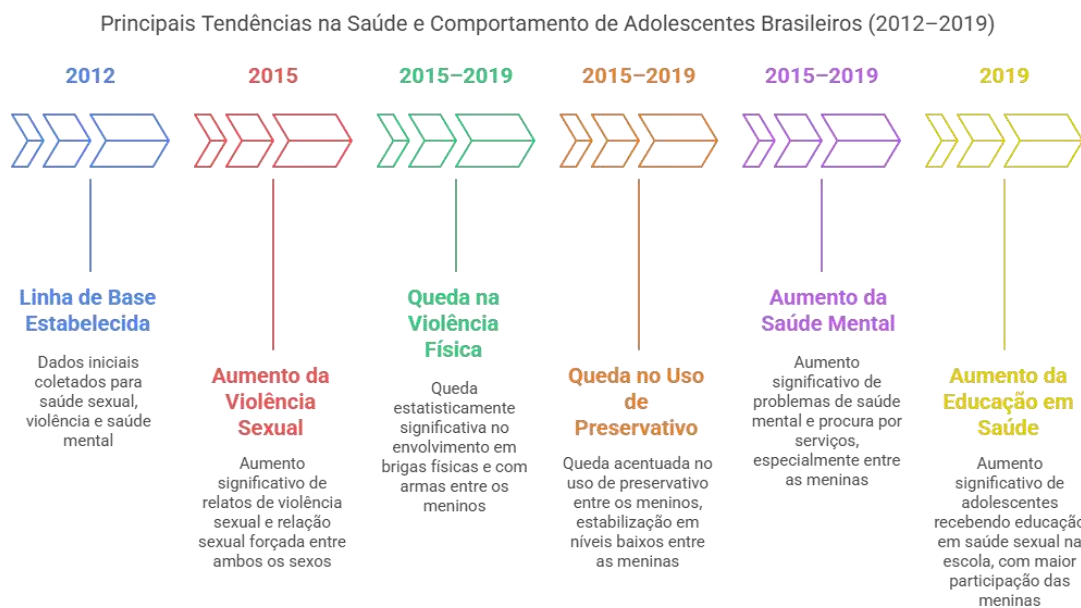
Violent Behavior and Exposure to Violence	Involvement in physical fights	2009	15,3	10,2	-	-
		2019	13,2	8,5	-13,7	-16,7
Mental Health and Access to Services	Felt lonely (often)	2009	8,7	16,3	-	-
		2019	12,2	20,6	+40,2	+26,4
	He sought health services	2009	42,5	48,1	-	-
		2019	48,3	51,7	+13,6	+7,5
School Environment and Educational Policies	Received sexual orientation at school	2009	82,4	85,6	-	-
		2019	87,2	88,3	+5,8	+3,2

Source: PeNSE (2009, 2012, 2015 and 2019), an official survey conducted by the IBGE and the Ministry of Health.

Note: For all indicators, the linear trend test by logistic regression was applied to verify the significance of the changes between the years. The changes were considered statistically significant in all cases, with $p < 0.05$. The level of significance was set at $p < 0.05$. The weighted percentage difference refers to the changes in the proportions by sex over the years, considering the sample weighting/year after stratification.

The results presented highlight important advances in the areas analyzed, especially in the reduction of risk behaviors, such as early sexual initiation and involvement in physical fights, and in the increase of sexual orientation in schools.

For the thematic areas analyzed (violent behaviors, violent behavior and exposure to violence, mental health and access to services, and school environment and educational policies), the statistical tests of linear trend by logistic regression indicated statistically significant changes ($p < 0.05$) in several dimensions, when considering the gender of the interviewees over the years of PeNSE.



The statistical tests confirm that the changes observed over time were



statistically significant for most indicators and groups, highlighting important differences by sex: boys showed greater involvement in risk behaviors, such as fights and reduced use of condoms, but also showed greater reduction in some indicators, such as involvement in physical fights and fights with weapons. While girls showed greater emotional vulnerability (mental health problems) and greater exposure to sexual violence, although they reported greater adherence to school educational actions and a lower prevalence of early sexual initiation.

However, challenges persist, such as the drop in condom use, increased loneliness and high numbers of violence among boys. More targeted policies, which consider gender differences, are essential to address these issues and promote the well-being of adolescents in Fortaleza.

DISCUSSION

The data point to persistent gender differences. Boys were more likely to engage in risky behaviors, such as early sexual initiation and involvement in fights, reflecting norms of masculinity that value early virility and physical confrontation. However, they also showed greater progress in some indicators, such as reduced involvement in physical violence.

Girls stood out for their greater adherence to school educational actions and for having lower rates of early sexual initiation, but showed greater emotional vulnerability, with a significant increase in reports of loneliness and greater exposure to sexual violence (Fields *et al.*, 2013; Ronchi *et al.*, 2018; Santos and Oliveira, 2020; Pse, 2024). This dichotomy shows that, while boys are more exposed to behavioral risks, girls suffer deeper psychic impacts.

The positive evolution in the receipt of school guidance in both sexes suggests the strengthening of policies such as the School Health Program (PSE), although there are still gaps in the gender approach in preventive actions (Oliveira *et al.*, 2017; Santos and Oliveira, 2020; Dos Santos and Santos Adinolfi, 2021; Pse, 2024). The drop in condom use, common to both groups, represents a worrying setback in safe sex practices.



CONCLUSION

The comparative analysis of the indicators by sex in Fortaleza highlights the complexity of the experiences of boys and girls in the school environment. The data suggest advances in some areas, but also warn of the persistence of inequalities and new challenges, especially in the field of mental health and sexuality.

It is necessary that public policies consider the specificities of gender in adolescence. Targeted strategies, sensitive to sociocultural and structural differences, are essential to ensure equity in access to information, health services, and school protection. Continuous monitoring of these indicators is essential to guide more effective interventions.

This study is limited to the analysis of self-reported secondary data, subject to response bias and omissions. The cross-sectional nature of PeNSE does not allow inference of causality. In addition, the geographic focus in Fortaleza restricts the generalization of the results. Finally, the absence of qualitative variables limits the understanding of the contexts and meanings attributed by the students to the reported experiences.



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