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ORIGINAL ARTICLE

Main results and public health implications of the National School Health Survey (ENSE), Colombia 2017

Principales hallazgos e implicaciones en salud pública de la Encuesta Nacional de Salud Escolar (ENSE), Colombia 2017

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Palabras clave:

Estudiantes; hábitos; escuelas; comidas; comportamiento sedentario; consumo sal; calidad de vida; actividades de ocio; promoción de la salud; alimentos procesados; estilo de vida saludable; agresión; bebidas azucaradas; intimidación.

Abstract

Introduction:

The school population represents a fundamental group for health promotion actions, given that the foundations of healthy behaviors in adult life are established in children and adolescents, who can be greatly influenced by the school.

Objective:

To describe the health-related behavioral factors of schoolchildren between 13 and 17 years of age in secondary and middle school in Colombia.

Methods:

A national cross-sectional study was conducted (i.e., School Health Survey -ENSE-) that recorded information on dietary practices, physical activity, alcohol and drug consumption, injuries and bullying, and oral, visual and hearing health. Sampling was probabilistic, cluster and multistage.

Results:

Schoolchildren have low consumption of fruits, vegetables (13.1%) and dairy (76.5 %), high consumption of ultra-processed foods (82.4 %), sugary drinks (74.0 %) and fast foods (14.8 %), frequent addition of salt at the table (43.3 %), low compliance with physical activity recommendations (15.0 %) and high sedentary lifestyle (46.3 %), frequent consumption of alcohol (44.7 %) and psychoactive substances (14.7 %), in addition to prevalent situations of bullying (15.4 %), rejection (8.2 %) and verbal aggression (42.7 %).

Conflict of interest:

The authors declare no conflicts of interest

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Conclusions:

The ENSE shows critical inequalities by gender, ethnicity and social class, throughout the country. The indicators observed in schoolchildren are precursors of various chronic and degenerative diseases and mental illness, which requires the urgent attention of the different social actors in the country.

Resumen

Introducción:

La población escolar es un grupo fundamental para las intervenciones de promoción de la salud, ya que en los niños y adolescentes se sientan las bases de un comportamiento saludable en la vida adulta, que puede ser muy influenciado por la escuela.

Objetivo:

Describir los factores comportamentales relacionados con la salud de los escolares de 13 a 17 años de edad que cursan educación básica secundaria y media en Colombia.

Métodos:

Se realizó una encuesta nacional transversal (Encuesta de Salud en Escolares -ENSE-) con los lineamientos de Global School-based Student Health Survey para recolectar información sobre prácticas alimentarias, actividad física, consumo de alcohol y drogas, lesiones e intimidación, y salud bucal, visual y auditiva. El muestreo fue probabilístico, por conglomerados y polietápico.

Resultados:

Se incluyeron 79.640 escolares de 298 municipios. Los escolares presentaron bajo consumo de frutas, verduras (13.1%) y productos lácteos (76.5 %), alto consumo de alimentos ultraprocesados (82.4 %), bebidas azucaradas (74.0 %) y comidas rápidas (14.8 %); alto uso de sal añadida en la mesa (43.3 %), actividad física inferior a la recomendada (15.0 %) y sedentarismo (46.3 %). Fue frecuente el consumo de alcohol (44.7 %) y sustancias psicoactivas (14.7 %) y reportaron situaciones de intimidación (15.4 %), rechazo (8.2 %) y agresiones verbales (42.7 %).

Conclusiones:

La ENSE muestra desigualdades por género, etnia y clase social en todo el país. Los hallazgos observados en los escolares son factores de riesgo de enfermedades crónico-degenerativas y mentales, y requieren la atención urgente de los actores sociales del país.

Remark

1) ¿Why was this study conducted?

The ENSE aimed to describe the health-related behaviors of students aged 13 to 17 years in secondary and middle schools in Colombia. This article presents the main results and public health implications of the ENSE 2017.

2) ¿What were the most relevant results of the study?

The ENSE shows disturbing figures of unhealthy behaviors and critical inequalities by gender, ethnicity, and social class throughout the country. In general, it was low consumption of fruits, vegetables, and dairy products, high consumption of ultra-processed foods and sugary drinks, low compliance with physical activity recommendations and highly sedentary lifestyle, frequent consumption of alcohol and psychoactive substances, in addition to prevalent situations of bullying, and poor perception of visual and auditory health.

3) ¿What do these results contribute?

These findings underscore the importance of urgent attention from the country's various social actors, because although the consequences are experienced in health, the causes are largely structural.

Introduction

From a life course perspective, many chronic diseases of adulthood, such as cardiovascular disease, several types of cancer, various health conditions such as obesity, the consequences of injury, and stress, are directly related to inappropriate practices in early life. These practices include poor eating habits, low physical activity, smoking, lack of personal coping skills, alcoholism, and other forms of addiction [1-3]. Therefore, the school-age population is an essential group for health promotion activities because the foundations for acquiring, practicing, and maintaining healthy behaviors in adulthood are laid at an early age, and school exerts a strong influence on children and adolescents because of the amount of time they spend in school [4,5]. In addition, health is closely related to academic performance and quality of life [6,7], so health and education must be part of an integrated process to reduce inequalities and achieve the population's overall well-being. Specifically, from the perspective of the social determinants of inequity and the theory of the social embodiment of health inequity, it is crucial to identify the intermediate determinants that are the result of structural injustices that, in Krieger's terms, are the result of the social determinants of inequity [8]. These are biologically incorporated into the social and ecological contexts of the material and social world in which we live.

Initially developed by the Centers for Disease Control (CDC) and the World Health Organization (WHO), the Global School-based Student Health Survey has been used in more than 100 countries to help set priorities, develop programs, and advocate for resources to promote health in schools [9,10]. These surveys have also been used to compare countries and can be used to evaluate health promotion policies and programs for schoolchildren and adolescents [11]. The 2017 National School Health Survey (ENSE) in Colombia was the first to be applied nationwide and is part of the National Survey System [12]. This study aimed to determine the behavior of health-related factors in students aged 13 to 17 years in secondary and middle schools in Colombia. This article describes its methods, summarizes the main results, and discusses their public health implications. Most of the data analyzed can be consulted in the tables of results, but some of the data reported can be found in the tables of the ENSE online book (https://www.minsalud.gov.co/salud/publica/epidemiologia/Paginas/Estudios-y-encuestas.aspx).

Materials and Methods

Type of study

The ENSE Colombia is a cross-sectional study with national coverage, developed according to the Global School-based Student Health Survey guidelines (See https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-school-based-student-health-survey). The survey collected information on dietary practices, physical activity, alcohol and drug use, injuries, bullying, and oral, vision, and hearing health. The survey was self-administered by students anonymously to ensure the confidentiality of responses and the reliability of results. The Institutional Ethics Committee approved the project, protocol no. 09-014 of June 16, 2014, and informed consent was obtained from the schoolchildren.

Sample design

The target population consisted of all students of both sexes enrolled in public and private educational institutions throughout Colombia between the ages of 13 and 17 (grades 6 to 11). The survey was conducted in educational institutions in urban and rural areas throughout the national territory. The design and estimation of the sample were based on the guidelines established by the National System of Population Studies and Surveys in Health of the Ministry of Health and Social Protection, where the main technical characteristics of the system are the representativeness of six primary regions (Atlantic, Eastern, Bogotá, Central, Pacific, and Orinoco-Amazon), departments, capitals, urban-rural stratification, and by sector (official and non-official institutions).

Sampling was probabilistic, clustered, and multistage. Each student in the universe had a known probability of selection greater than zero. Municipalities were defined as first-level clusters (primary sampling units) - all departmental capitals included - and educational institutions as second-level clusters (secondary sampling units). Classrooms were considered as tertiary sampling units. The selection process was carried out in three successive stages, starting with the selection of the Primary Sampling Units (municipalities): the 32 capitals of each department with forced inclusion, the other 266 municipalities with probability proportional to the number of enrolled students, continuing with the Secondary Sampling Units (educational establishments), also with probability proportional to the number of enrolled students, and considering the stratification by zone (rural and urban) and sector (official and non-official). The third stage randomly selected grades according to school size with an equal probability of selection, considering grades 6-11.

A sample of approximately 88,629 students was estimated using the simple random sampling formula adapted to a Kish cluster design [13]. The sample was distributed in 1,190 establishments in 298 municipalities, with a prevalence of 9.78%, which corresponds to the prevalence of cigarette use (last month) in the group of 13- to 17-year-olds of the National Study on the Use of Psychoactive Substances in the School Population in Colombia for 2011 [14]. In addition, a relative standard error of 5%, a design effect of 1.3, and a nonresponse rate of 20% were considered.

Data collection

To carry out the surveys, trained and qualified personnel were divided into twenty-six teams, each consisting of a supervisor and five interviewers. The supervisors performed the following tasks: assigning institutions to the interviewers, monitoring, verifying the progress of the fieldwork, preparing weekly reports, and sending surveys to the central team, which consisted of the Survey Directorate and the Logistics and Operations Directorate, ensuring the support of the field teams, supervising the entire fieldwork process, coordinating the crews and directing the programming throughout the country, as well as receiving and consolidating the information collected in the different teams.

This survey is designed for schoolchildren, with a self-completion methodology, focusing on alcohol consumption, eating habits, drug use, hygiene, mental health, physical activity, protective factors, violence, and unintentional injuries. In Colombia, the ENSE was designed based on the approach developed by the WHO and the CDC, incorporating the specific aspects of the country related to the needs of this population to deepen the knowledge of risk behaviors in the school population, their visual and hearing health, and the promotion activities in schools. The ENSE consists of 6 modules: Eating Behaviors, Injuries and Bullying, Alcohol, Drug Use, Oral, Vision and Hearing Health, and Physical Activity.

Quality control and assurance

A web-based information system was developed and implemented for data entry, storage, troubleshooting, geographic visualization, and reporting through digital forms, allowing quality control through indicators such as participation, coverage, refusal, and performance rates. The quality of the physical surveys was also verified, and a randomly selected 10% of them were compared with the data entered to identify possible errors in data management.

Data analysis

A descriptive analysis and prevalence calculation were performed, considering the disaggregation by the six primary regions (Atlantic, Eastern, Central, Pacific, Orinoco-Amazon, and Bogotá), area (urban and rural), and the main capitals (Cali, Medellín, and Barranquilla), sex (male, female), ethnicity (indigenous, black/mulatto/palenquero/Afro-descendant) and sector of the educational institution (official and non-official). The reported prevalences were adjusted by expansion factors according to the size of the population by age group, sex, and sector. The 95% confidence interval accompanied all prevalences as a measure of uncertainty.

Results

A total of 79,640 students were included, of whom just over half were female (53.5%) and between the ages of 15 and 16 (50.7%). A total of 22.8% self-identified as belonging to an ethnic minority group, mainly black, mixed race, or Afro-descendant. The selected students were most likely to reside in the Atlantic (24.0%) and Central (24.1%) regions, followed by the Eastern region (19.1%). Most of them belonged to public schools (86.4%) and were in the seventh (21.7%) and tenth (22.2%) grades. Of the total population surveyed, one in ten had a paid job, and one in five reported going hungry in the past month (Table 1).

Eating behaviors

The WHO and Food-Based Dietary Guidelines (FBDG) recommended frequency of fruit and vegetable consumption [15] five times a day but was not met by most students (86.9%, 95% CI: 86.2-87.6). This prevalence of non-compliance is slightly higher in the indigenous population (87.9%). The Central region (88.1%) and Medellín (91.2%) had the highest prevalence. In rural areas, 84.6% of students did not comply with the recommendations, a slightly lower percentage than in urban areas (87.4%). In addition, students in non-formal sector institutions (88.1%) were more likely to not comply with the frequent consumption of fruits and vegetables (Table 2).

It was found that 76.5% (95% CI: 74.9-77.9) of the schoolchildren did not consume dairy products at the frequency recommended by the Food-based Dietary Guidelines, which is at least three servings per day. The indigenous school population was the least likely to consume dairy products at the recommended frequency (81.7% consumed less than three servings daily). Similarly, the region with the lowest consumption of dairy products was the Orinoco-Amazon region (82.9%), and among cities, Cali (77.6%). Consumption of dairy products below the Food-Based Dietary Guidelines recommendations was higher in rural areas (80.5%) than in urban areas (75.7%), and the prevalence of students not meeting the recommended consumption was higher in official sector institutions (77.3%) than in non-official institutions (71.1%) (Table 2).

Table 1. Characteristics of school children, Colombia ENSE 2017

Variable	%	CI 95%
Sex		
Female	53.5	(52.3-54.6)
Ethnicity		
Indigenous	8.9	(7.0-11.3)
Black/Mulatto/Afro/Palenquero	13.9	(10.6-18.0)
Non-ethnicity	77.2	(72.2-81.6)
School Grade		
Seventh	21.7	(19.3-24.4)
Eighth	21.4	(19.1-23.9)
Ninth	16.9	(15.2-18.7)
Tenth	22.2	(20.1-24.4)
Eleventh	17.8	(15.7-20.1)
Region		
Atlantic	24.0	(14.9-36.2)
Oriental	19.1	(11.6-29.8)
Bogotá	14.1	(2.2-54.0)
Central	24.1	(14.8-36.6)
Pacific	15.8	(8.5-27.6)
Orinoco-Amazon	2.9	(1.6-5.4)
Zone		
Urban	83.6	(77.2-88.4)
Rural	16.4	(11.6-22.8)
Sector		
Official	86.4	(80.3-90.8)
Unofficial	13.6	(9.2-19.7)
Paid work		
Yes	11.8	(11.0-12.6)
No	88.2	(87.4-89.0)
Going hungry in the last month		
Never	78.3	77.0-79.6
Rarely	14.2	13.3-15.2
Sometimes	6.1	5.4-7.0
Most of the times	0.8	0.6-0.9
Always	0.6	0.5-0.8

Male students were more likely to consume sugar-sweetened beverages (75.4%; 95% CI: 73.9-77.0) than females (72.7%). In addition, a higher prevalence of consumption was observed among students who self-identified as black, mulatto, or Afro-descendant (76.4%), in urban areas (74.5%), in public schools (77.3%), and in the Atlantic region (76.4%) (Table 2). It was found that 43.3% (95% CI: 41.4-45.1) of schoolchildren added salt to their meals between one and more than five times a day. By region, the highest prevalence was observed in Bogotá, where 48.6% of students added salt at least once daily, followed by the Eastern part with 46.0%. In addition, males were more likely to add salt (45.3%) than females (41.4%) (Table 2).

The results show that 82.4% (95% CI: 81.2-83.4) of schoolchildren had consumed packaged foods at least once in the previous seven days. The region with the highest prevalence of this consumption was the Central region (85.5%), followed by Medellín (86.4%). Consumption increased in urban areas (82.7%) and non-official schools (83.5%). Students of black or mulatto ethnicity (80.8%) and, especially, the indigenous population (76.4%) had the lowest prevalence of consuming one or more packaged foods per day (Table 2).

It was observed that 14.8% (95% CI: 14.1-15.6) of students consumed fast food three or more times per week, and this behavior was more frequent among females (15.6%: 95% CI: 14.7-16.6) than males (13.9%). The highest frequency of fast-food consumption per week was reported in Medellin (at least once per week: 20.0%). In addition, students in the informal sector (19.3%) reported higher fast-food consumption than those in the formal sector (14.1%). Afro-descendant students reported a higher frequency of fast-food consumption per week (15.2%), while the lowest consumption was observed among indigenous students (11.1%).

Table 2. Eating behaviors, physical activity and sedentary lifestyles of school children, Colombia ENSE 2017

	Consume fruit and vegetables < 5 times/day		Consume < 3 servings of dairy or dairy products/day		Consume sugary drinks (1x/day		Add salt at least once a day		Consume bagged or packaged products at least once in the last 7 days.		Meets commendations for >60 minutes of physical activity per day		Spends ≥3 hours/day in activities that require sitting down	
	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%
Sex														
Male	86.3	85.4-87.1	76.0	73.8-78.0	75.4	73.9-77.0	45.3	43.3-47.4	80.0	78.3-81.6	19.5	18.6-20.4	42.8	39.2-46.6
Female	87.5	86.7-88.2	76.8	75.6-78.0	72.7	71.8-73.7	41.4	39.6-43.2	84.4	83.5-85.3	11.5	10.9-12.1	49.4	46.3-52.6
Ethnicity														
Indigenous	87.9	85.9-89.6	81.7	79.1-84.1	72.8	69.5-75.8	44.1	40.7-47.6	76.4	73.0-79.6	13.8	12.2-15.6	34.2	31.1-37.4
B.M.A.P.	86.4	85.2-87.6	77.1	75.5-78.6	76.4	74.7-78.1	41.9	39.5-44.4	80.8	79.4-82.2	15.4	14.2-16.7	44.5	41.5-47.5
Non-ethnicity	87.0	86.2-87.7	75.7	74.3-77.1	73.8	72.6-74.9	43.2	41.0-45.4	83.6	82.3-84.7	15.4	14.9-16.0	48.3	44.9-51.7
Region														
Atlantic	86.5	85.0-87.9	78.0	76.4-79.5	76.4	74.9-77.8	37.4	35.3-39.6	79.3	77.2-81.1	14.4	13.4-15.5	42.8	37.6-48.1
Oriental	86.7	84.4-88.8	76.7	74.5-78.8	73.1	71.5-74.7	46.0	44.3-47.7	81.8	79.2-84.1	15.6	14.1-17.1	44.0	40.7-47.4
Bogotá	87.1	87.0-87.1	72.3	72.1-72.5	76.5	76.5-76.5	48.6	48.3-48.8	84.2	84.1-84.4	16.3	16.3-16.3	55.5	54.9-56.1
Central	88.1	86.6-89.6	74.5	72.0-76.8	74.1	72.4-75.8	42.6	40.3-44.9	85.5	84.5-86.4	14.9	13.8-16.0	48.5	43.1-54.0
Pacific	86.1	85.2-86.9	79.3	77.7-80.8	68.6	64.9-72.2	45.7	43.0-48.4	82.2	80.4-83.8	15.3	14.6-16.0	44.7	39.5-50.1
Orinoco-Amazon	85.0	82.9-87.0	82.9	80.1-85.3	75.9	72.6-79.0	40.4	37.2-43.7	77.4	74.3-80.2	16.7	14.7-18.9	35.2	31.4-39.2
Main Municipalities														
Cali	86.0	85.6-86.5	77.6	77.2-77.9	74.3	73.3-75.2	46.5	46.0-47.0	80.6	80.3-81.0	15.9	15.7-16.2	53.8	53.4-54.1
Medellín	91.2	90.3-92.0	68.5	64.3-72.4	76.9	75.1-78.6	48.9	46.5-51.3	86.4	85.6-87.1	13.7	12.2-15.3	60.6	57.9-63.2
Barranquilla	88.5	88.3-88.6	76.7	76.2-77.3	75.7	74.0-77.2	38.2	37.6-38.8	75.4	73.9-76.9	14.6	14.4-14.9	55.7	55.5-55.9
Zone														
Urban	87.4	86.6-88.1	75.7	74.1-77.2	74.5	73.4-75.6	43.8	41.8-45.8	82.7	81.5-83.9	15.5	14.9-16.1	48.8	45.6-51.9
Rural	84.6	83.0-86.1	80.5	79.0-81.9	71.3	69.7-72.9	40.6	38.7-42.5	80.6	78.9-82.2	13.9	12.6-15.2	33.9	31.4-36.5
Institution														
Official	86.7	85.9-87.5	77.3	75.9-78.6	73.5	72.3-74.6	42.6	40.8-44.3	82.2	81.1-83.2	15.0	14.3-15.8	44.2	41.1-47.4
Unofficial	88.1	86.8-89.3	71.1	68.5-73.5	77.3	75.6-78.9	47.8	46.1-49.4	83.5	82.2-84.8	16.3	14.5-18.2	59.3	57.3-61.3
Total	86.9	86.2-87.6	76.5	74.9-77.9	74.0	72.9-75.0	43.3	41.4-45.1	82.4	81.2-83.4	15.2	14.7-15.8	46.3	43.0-49.6

Acronyms: B.M.A.P. Black/Mulatto/Afro/Palenquero; PE, Pertenencia Étnica

It was found that 47.3% (95% CI: 45.9-48.8) of the students consumed more than one fried food daily. Females consumed more of these foods daily (48.7%) than males (45.8%). Students of black ethnic origin had a higher prevalence of fried food consumption per day (50.7%) than those of non-ethnic origin (47.2%) and indigenous people (43.2%). The city with the highest percentage of fried food consumed daily was Medellín (52.0%), more than 12 percentage points higher than Barranquilla (39.7%), with the lowest rate of fried food consumed daily. Schoolchildren in the Central region (53.1%) and those in public institutions (48.4%) consumed the most fried foods daily.

Physical activity and sedentarism

Only 15.2% (95% CI: 14.7-15.8) of schoolchildren met the recommendation of 60 minutes of physical activity per day, with differences according to sex and geographical distribution: males were more likely to meet the recommended minutes of physical activity (19.5%) than females (11.5%), and rural areas were less likely to meet this recommendation than urban areas (13.9%; vs. 15.5%) (Table 2). The highest percentage of physical activity compliance by region was found in the Orinoco-Amazon region, with 16.7%. The other regions had similar prevalence among themselves and with the total percentage. In addition, Medellin reported lower compliance (13.7%) than the other significant cities analyzed (Table 2). Regarding the number of days of physical activity, half of the students were active for at least 60 minutes/day on two or fewer days.

Regarding sedentary behavior, nearly half of Colombian students reported spending three or more hours per day in their free time watching television, playing video games, or surfing the Internet (46.3%; 95% CI: 43.0-49.6). Female students reported a higher frequency of sedentary behavior than males (49.4% vs. 42.8%). A higher prevalence of sedentary behavior was observed in the larger cities, first in Medellin (60.6%), followed by Bogotá (55.5%), Barranquilla (55.7%), and Cali (53.8%). The Central region also had a high prevalence of sedentary behavior (48.5%), as did students who did not identify with any ethnic group

Table 3. Consumption of alcohol, psychoactive substances, violence and bullying in Colombian schoolchildren, ENSE 2017

	Prevalence of alcohol use in the last month		Lifetime prevalence of psychoactive substance use		Been physically assaulted at least once in the last 12 months		Been intimidated at least one day in the last month		Been rejected at least one day in the last month		Been verbally assaulted at least one day in the last month	
	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%	%	CI 95%
Sex												
Male	44.2	42.2-46.1	15.0	13.1-17.2	23.1	21.9-24.4	14.8	13.9-15.6	8.6	8.1-9.2	42.6	41.4-43.7
Female	45.1	42.7-47.5	14.4	11.9-17.2	18.0	16.8-19.3	15.9	15.1-16.7	7.7	7.1-8.3	42.8	41.7-43.8
Ethnicity												
Indigenous	40.9	37.2-44.8	12.7	9.8-16.3	23.8	20.9-27.0	18.3	16.1-20.7	13.7	11.5-16.2	40.5	38.1-43.0
N.B.A.P.	44.0	41.9-46.2	12.7	10.5-15.3	21.2	19.5-22.9	16.3	14.7-18.1	10.7	9.7-11.8	46.2	44.0-48.3
Non-ethnicity	45.4	43.1-47.8	15.1	12.8-17.8	19.7	18.5-20.9	14.7	14.0-15.4	6.9	6.5-7.3	42.5	41.6-43.4
Region												
Atlantic	38.5	36.0-41.2	7.0	5.9-8.4	22.1	20.2-24.0	14.7	13.6-15.8	9.8	8.7-11.1	44.5	42.7-46.3
Oriental	43.7	41.4-46.1	13.7	11.0-17.0	21.8	18.9-25.0	15.5	13.6-17.6	7.5	6.0-9.2	42.8	40.8-44.8
Bogotá	46.9	46.8-47.0	18.4	18.2-18.6	22.9	22.8-23.1	16.3	16.1-16.5	8.0	7.9-8.2	42.8	42.2-43.3
Central	52.4	48.0-56.6	21.5	16.5-27.6	18.8	17.7-19.9	16.1	14.8-17.5	7.7	7.0-8.3	43.3	41.8-44.7
Pacífic	41.5	39.6-43.4	14.7	13.3-16.3	17.2	15.6-19.0	14.6	13.0-16.4	7.6	6.6-8.9	38.7	36.5-41.0
Orinoco-Amazon	45.2	40.5-50.0	11.0	9.2-13.2	20.3	17.4-23.4	16.5	14.2-19.1	9.0	7.0-11.4	45.0	41.7-48.3
Main Municipalities												
Cali	42.9	42.5-43.2	16.8	15.7-17.9	18.3	17.7-18.9	14.8	14.2-15.4	6.7	6.5-6.9	41.0	40.0-41.9
Medellín	61.7	59.8-63.6	34.3	30.3-38.5	19.8	17.9-21.8	18.0	16.0-20.3	7.2	6.4-8.0	45.3	43.7-47.0
Barranquilla	38.4	38.1-38.7	9.0	8.5-9.4	23.2	22.6-23.8	14.2	14.0-14.4	7.4	7.0-7.9	43.9	42.2-45.7
Zone												
Urban	45.3	43.0-47.6	15.8	13.4-18.6	21.0	19.8-22.3	15.8	15.0-16.6	8.1	7.6-8.6	42.9	42.1-43.8
Rural	41.8	39.8-43.9	9.2	8.1-10.5	18.1	16.4-19.9	13.7	12.5-15.0	9.0	8.0-10.1	41.7	39.5-44.0
Institution												
Official	44.4	42.3-46.5	14.8	12.4-17.5	20.6	19.3-21.8	15.1	14.4-15.9	8.4	7.8-9.0	42.4	41.5-43.3
Un-official	46.8	43.7-50.0	14.6	12.1-17.3	20.3	19.0-21.8	17.4	16.5-18.4	7.2	6.4-8.1	44.7	42.8-46.7
Total	44.7	42.7-46.7	14.7	12.6-17.2	20.5	19.4-21.7	15.4	14.8-16.2	8.2	7.8-8.7	42.7	41.9-43.6

Acronyms: B.M.A.P. Black/Mulatto/Afro/Palenquero

(48.3%). Students in non-official schools had a higher prevalence of sedentary behavior (59.3%) than those in official schools (44.2%), as did students in urban areas (48.8%) compared with those in rural areas (33.9%) (Table 2).

Alcohol consumption

The results show that 44.7% of the students surveyed had consumed alcohol in the past month (95% CI: 42.7-46.7), and this behavior was even more prevalent in the Central region (52.4%); among the major cities, Medellin had the highest reported alcohol consumption (61.7%). Students with no ethnic affiliation had a slightly higher frequency of use than the national average (45.4%), while those who identified themselves as indigenous reported less frequent use (40.9%). Finally, the frequency of use was higher in urban areas than in rural areas (45.3 vs. 41.8 %) (Table 3).

On the one hand, 40.9% (95% CI: 38.6-43.3) of the students surveyed had consumed alcohol for the first time before the age of 14. This proportion was higher among males (43.7%; 95% CI: 41.5-45.9) than among females (38.5%; 95% CI: 35.8-41.2). On the other hand, 68.2% of respondents reported having at least one drink in their lifetime (95% CI: 66.1-70.2), with this prevalence being higher among students with no ethnic affiliation (69.8%) than among those who self-identified as Afro-descendant or indigenous. Similar to the findings for past-month use, the Central region had the highest prevalence of lifetime use (74.8%), and among the cities, Medellin had the highest prevalence (83.7%).

Alcohol consumption was higher in urban areas (69.1%) and non-official schools (70.8%) than in official schools. Among students, 13.3% (95% CI: 12.7-14.0) reported having problems with family or friends, missing school, or getting into fights one or more times because of alcohol consumption. Notably, 14.7% (95% CI: 13.4-16.0) of males reported buying alcohol directly, making this practice less common among females.

Consumption of psychoactive substances

Overall, 14.7% of students reported ever having used a psychoactive substance in their lifetime (95% CI: 12.6-17.2), with the highest use reported in the Central region (21.5%). In the main cities, one in three students in Medellin reported lifetime use (34.3%), twice as many as in Bogotá (18.4%), the city with the second highest reported use. In contrast, prevalence was lower in rural areas (9.2 %) than in urban areas (15.8 %) (Table 3).

In addition, 8.5% of students reported having used illicit drugs for the first time before age 14 (95% CI: 7.4-9.8). Below this age, reporting was shallow, and estimates were statistically unstable. Regarding the regional forecast, the Central region had the highest proportion of use (11.2%), and among the main cities, Medellin had the highest prevalence (16.6%). The ratio was higher in urban areas (9.1%) than in rural areas (5.3%).

The results show that 8.4% (95% CI: 7.3-9.5) of students reported that it was straightforward to obtain psychoactive substances. Among urban students, the perception of "effortless" access to psychoactive substances (9.1%; 95% CI: 8.0-10.2) was almost twice as high as among rural students (4.8%). Among the four primary cities, Medellín had the highest rate of perceived easy drug access (14.5%).

It was found that 12.9% (95% CI: 11.0-15.1) of respondents reported having used marijuana at least once in their lifetime, and for marijuana use at least once a month, the prevalence was 7.9% (95% CI: 6.8-9.1), with a higher proportion among males (8.6%; 95% CI: 7.6-9.8) compared with females (7.2%).

Physical aggression and involvement in fights

It was observed that 20.5% (95% CI: 19.4-21.7) of students reported having been victims of physical aggression at least once in the last 12 months, with this occurrence being higher among males (23.1%) than females (18.0%). In addition, indigenous students reported a higher prevalence of being victims of aggression (23.8%; 95% CI: 20.9-27.0) compared to students from other ethnic backgrounds (19.7%) (Table 3).

By region, students from Bogotá were more likely to have been victims of physical aggression and to have participated in fights (22.9%) than students from other regions of the country, such as the Pacific (17.2%). In addition, students from urban areas were more likely to be victims of physical aggression (21.0%) than students from rural areas (18.1%) (Table 3).

Involvement in physical fights was almost twice as frequent among males (32.6%) as among females (17.1%). Among males, 12.3% (95% CI 11.6-13.1) reported being assaulted only once in the last 12 months, while another 6.5% were assaulted twice or thrice, and 1.7% were assaulted four times. Females were less likely to report assault: 9.7% once in the last 12 months, 5.0% two to three times, and 1.3% four times.

Intimidation, rejection, and verbal aggression

Among all students, 15.4% (95% CI: 14.8-16.2) reported being bullied at least one day in the past month, with lower percentages for males (14.8%; 95% CI: 13.9-15.6) than females (15.9%). In addition, a higher rate of reported bullying was found among students who self-identified as indigenous (18.3%) (Table 3).

Regarding the frequency of bullying, 9.9% (95% CI: 9.3-10.6) of male students reported being bullied one to two days in the last month, 2.3% (95% CI: 2.1-2.6) three to five days, 0.9% (95% CI: 0.8-1.2) six to nine days, and 0.6% (95% CI: 0.5-0.8) ten to nineteen days. Among females, 10.4% (95% CI: 9.8-11.1) reported being bullied one to two days in the past month, 2.7% (95% CI: 2.5-3.0) three to five days, 0.9% (95% CI: 0.8-1.1) six to nine days, and 0.7% (95% CI: 0.5-0.8) ten to nineteen days.

The results show that 8.2% (95%CI: 7.8-8.7) of students reported having been socially rejected at least once in the last month, with males more likely to report having been rejected (8.6%) than females (7.7%); in the Atlantic region, this report was more frequent (9.8%) (Table 3).

Verbal aggression in the last month was reported more frequently (42.7%; 95% CI: 41.9-43.6) than the bullying and rejecting behaviors described above. The frequency of this type of aggression was similar for both sexes (Table 3). It was more frequent among students from the Orinoco-Amazon region (45.0%; 95% CI: 41.7- 48.3) and less frequent among students from the Pacific region (38.7%). The differences were minor among students from non-official institutions (44.7%; 95% CI: 42.8 - 46.7) compared to those from official institutions (42.4%) (Table 3). Regarding the frequency of verbal assaults, 25.9% (95% CI: 25.0-26.9) of males and 27.8% of females reported being assaulted one or two days in the last 30 days; similar frequencies were found between males and females for three to five assaults per month (6.6% vs. 6.9%), six to nine assaults (3.2% vs. 2.5%), and 10 to 19 assaults (2.1% vs. 1.8%).

Oral, visual, and hearing health

It was found that 80.7% (95% CI: 79.9-81.4) of Colombian schoolchildren perceived their oral health as excellent or good, with no gender differences. Students from the Orinoco-Amazon region (76.1%; 95% CI: 72.9-79.1), those who self-identified as indigenous (77.4%; 95% CI: 75.2-79.5), and those from rural areas (78.4%; 95% CI: 76.6-80.2), reported the lowest percentages of good self-perception of their oral health (Table 4).

It was observed that 46.3% (95% CI: 44.3-48.3) of the students reported some visual problem related to seeing or reading on the board or near-vision or reading. When compared by gender, females had a higher prevalence than males (52.8% vs. 38.6%). Schoolchildren living in urban areas reported more vision problems than those living in rural areas (47.7 vs. 39.0%), and this prevalence was higher among schoolchildren in non-official sector institutions than among those in the official sector (49.3 vs. 45.8%) (Table 4).

Table 4. Perception of oral, visual and hearing health among Colombian schoolchildren, ENSE 2017

	Excellent or good perception of Oral Health status		Perception of visual problems		Prevalence of hearing problems	
	%	CI 95%	%	CI 95%	%	CI 95%
Sex						
Male	80.4	79.4-81.4	38.6	37.1-40.2	25.2	24.1-26.2
Female	81.0	80.0-82.0	52.8	50.2-55.4	26.1	25.1-27.1
Ethnicity						
Indigenous	77.4	75.2-79.5	46.1	42.5-49.7	30.9	28.5-33.4
Black/Mulatto/Afro/Palenquero	79.0	77.5-80.4	46.2	43.6-48.9	29.5	27.9-31.2
Non-ethnicity	81.6	80.8-82.4	46.1	44.1-48.1	23.9	23.1-24.8
Region						
Atlantic	78.9	77.4-80.2	44.7	42.8-46.7	27.9	26.1-29.8
Oriental	80.6	79.4-81.8	45.3	42.3-48.4	24.6	21.0-28.5
Bogotá	81.3	81.3-81.3	52.4	52.2-52.6	25.5	25.3-25.7
Central	82.6	81.0-84.2	45.9	42.9-49.0	24.9	23.8-26.0
Pacific	80.9	79.0-82.7	45.7	42.4-49.0	25.6	24.0-27.2
Orinoco-Amazon	76.1	72.9-79.1	41.7	38.9-44.5	26.0	24.5-27.5
Main Municipalities						
Cali	83.5	83.1-83.9	50.8	49.6-51.9	26.6	26.2-27.0
Medellín	85.6	84.2-86.9	53.1	50.4-55.8	25.2	23.2-27.3
Barranquilla	80.2	79.0-81.3	48.2	47.7-48.7	26.2	26.0-26.4
Zone						
Urban	81.1	80.4-81.9	47.7	45.8-49.6	25.8	24.9-26.8
Rural	78.4	76.6-80.2	39.0	37.6-40.4	25.6	23.5-27.7
Institution						
Official	79.8	78.9-80.6	45.8	44.0-47.6	25.9	24.9-26.9
Non official	86.6	85.1-88.0	49.3	46.4-52.2	24.9	23.5-26.4
Total	80.7	79.9-81.4	46.3	44.3-48.3	25.8	24.9-26.7

The results show that 25.8% (95% CI: 24.9-26.7) of the students reported hearing or ear problems. Of these, 18.1% (95% CI: 17.5-18.7) had perceived the situation in the last 30 days, and 10.4% (95% CI: 9.9-10.9) had been diagnosed. The prevalence of hearing problems was higher among indigenous students (30.9%) and those who self-identified as black/mulatto/ Palenquero or Afro-descendent (29.5%) (Table 4).

Discussion

The results of the ENSE show a high prevalence of risky behaviors among Colombian adolescents. Increased consumption of ultra-processed foods (82.4%) and sugar-sweetened beverages (74.0%), frequent consumption of fast food (14.8%), and table salt (43.3%), and low consumption of fruits, vegetables (13.1%), and dairy products (76.5%) were observed. In addition, a highly sedentary lifestyle (46.3%), low compliance with physical activity recommendations (15.0%), frequent consumption of alcohol (44.7%) and psychoactive substances (14.7%), as well as situations of intimidation (15.4%), rejection (8.2%), and verbal aggression (42.7%) were observed. The results show a good perception of oral health (80.7%) but also the presence of symptoms that could indicate visual (46.3%) and auditory (25.8%) problems.

The above findings are consistent with what has been described in the literature on risk behaviors among adolescents in the school population in recent decades. It is observed that unhealthy behaviors in Colombia and the world are maintained or tend to worsen. Specifically, the Colombian adolescent population's inappropriate eating habits are increasing, related to the difficulty in achieving optimal nutritional status for age. In 2010, the ENSIN reported that 54.6% of adolescents had frequent weekly consumption of sugar-sweetened beverages, with a 25.9% increase in the prevalence of overweight or obesity compared to the previous five-year period [16]. In 2015, according to the FUPRECOL study, more than 50% of schoolchildren had a poor-quality diet, and this was even more prevalent among adolescents (13 to 17 years old) compared to children aged 9 to 12 [17].

In Latin America and the Caribbean (LAC), overweight and obesity are rising rapidly among children and adolescents, doubling prevalence from 16.2% in 2000 to 30.5% in 2016 [18]. According to the 2020 Global Food and Nutrition Security Outlook Report, the cost of a healthy diet in Latin America and the Caribbean is the highest compared to other regions. Calorie-dense and nutrient-dense products are less expensive than fresh and nutrient-rich foods, leaving 26.5% of the population without a healthy diet [18].

Although there is evidence that regular physical activity in adolescents reduces the likelihood of developing chronic non-communicable diseases [19-21] and the risk of death from these diseases [2], the current practice of physical activity in this population is low and, worryingly, continues to decline [22,23]. This situation contributes to the problems of sedentary lifestyles in childhood and adolescence. Approximately 80% of adolescents worldwide do not meet the recommended physical activity for their age [24]. This is in line with the results of the ENSE, where it was observed that the percentage of adherence to the recommendations did not exceed 15% and that one in two children and adolescents spent three or more hours a day sitting, watching television, playing video games, or talking to their friends during their leisure time. It should be noted that the sum of these risk behaviors (poor diet, sedentary lifestyle, and low levels of physical activity) has contributed to the development at younger ages of several chronic non-communicable diseases that were previously restricted to the adult population [25,26].

The ENSE Colombia found a high lifetime prevalence of alcohol use (68.2%), similar to that reported in other Latin American countries, such as Uruguay (68.5%) [27] and Brazil (71.4%) [28]. Similarly, the estimated prevalence of last month's alcohol use was 44.7%, slightly lower than the Uruguayan prevalence of 48.6%. [27], but higher than the estimated 35.3% for Paraguay [29] and 36% for Chile [30]. Concerning psychoactive substances, the EMSE International survey found that the lifetime prevalence of illicit drug use in Guatemala was 9% [31], 11.1% in El Salvador [32],

and 11.7% in Argentina, with a higher percentage among males [33], while the ENSE Colombia found a rate of 14.7%, higher than the above countries. It should be noted that, globally, the use of psychoactive substances is a problem of concern to governments around the world, as their excessive use has been linked to physical and mental health conditions and other types of issues, including violence related to illicit drug trafficking, injuries and deaths in road traffic accidents, occupational accidents, and reduced work capacity [34,35].

ENSE students reported experiencing bullying (15.4%), rejection (8.2%), and verbal aggression (42.7%) on at least one day in the last month. This issue was followed up in the report on the State of the World's School Violence and Bullying, where it was reported that approximately 246 million children and adolescents experience violence at school each year and that the proportion of those who are bullied varies between countries from 10% to 65% [36], making it the most common form of violence in schools. In Colombia, studies of bullying in schools have reported prevalence rates ranging from 14.7% to 90.1%, depending on the instruments used, grade, gender, the municipality where the study was conducted, and the type of bullying [37,38].

The ENSE addresses aspects (oral, visual, and hearing health) integral to children and adolescents' well-being, health-related quality of life, and school performance. The ENSE results on oral health are positive, as most adolescents perceive their oral health as good or excellent. Regarding visual and hearing health, one out of two students reported some symptoms that could indicate visual problems and one out of four reported symptoms related to hearing problems. This situation should be studied in the school environment as it is significantly related to learning and adequate psychosocial development [39].

One of the main limitations of the ENSE is that it is designed to be self-administered by schoolchildren, which may lead to a lack of precision in some of the reports, mainly regarding the foods consumed in the dietary assessment and the characterization of physical activity. Consequently, the analysis did not include the variables reported for weight and height. However, due to the anonymity of the survey, other variables, such as bullying at school, the use of psychoactive substances, and alcohol, can be more freely and reliably reported by students.

In general, the ENSE Colombia helps us to understand, from the model of social determinants of health, those intermediate determinants related to structural processes of inequality that reproduce processes of social inequality. The above, specifically in the analysis of inequalities in what schoolchildren eat, how active/sedentary they are, what psychoactive substances and alcohol they have been exposed to, what bullying and aggression have affected them, and how they perceive their oral, visual, and auditory health, help us to reflect, as a whole, on the systematic processes of social injustice that manifest themselves in health inequalities in the medium and long term. Inequalities based on gender, ethnicity, and social class, isolated or intersecting in urban and rural areas and the country's regions and major cities, paint a critical picture. Many indicators suggest that these school populations "incubate" various chronic, degenerative, and mental illnesses that require urgent attention from the country's different public and private social actors. From a life-course perspective, cardiovascular pathologies, cancer, anxiety, and depression should be addressed at these ages with a vision of morbidity and mortality prevention and a focus on health promotion.

Adolescence is a critical developmental period that marks a time of transition with significant changes in many behaviors, as the vulnerability and multiple changes that individuals experience affect their personalities and actions in everyday life [40]. As healthy habits are established early, health risk behaviors in this population may persist into adulthood and contribute to increased morbidity and mortality [41]. Therefore, intervention proposals should promote healthy habits among Colombian adolescents, considering a differentiated approach and the social and environmental context in which they live.

There are legal and technical instruments to address this situation, but they must be strengthened and implemented. An example is Law 1355 of 2009, which establishes a public policy for preventing obesity, which, according to this study, is inadequate. In this regard, a survey in Cali showed that the school food environment is characterized by offering ultra-processed foods at low prices, in contrast to a low bid of vegetables at high prices, with differences between schools favoring students from high socioeconomic strata [42]. This is just one example of public policy strategies for school environments that promote the development and maintenance of healthy lifestyles that can be analyzed through population-based surveys such as the ENSE.

Conclusions

The ENSE Colombia 2017 shows worrying figures of unhealthy behaviors and critical inequalities by gender, ethnicity, and social class across the country. The results indicate: high consumption of sugary drinks and ultra-processed foods; frequent consumption of fast food and salt at meals; low consumption of fruits, vegetables, and dairy products; high prevalence of sedentary behavior and low adherence to physical activity guidelines; frequent consumption of psychoactive substances; and experiences of bullying, rejection, and verbal aggression. The results also revealed a high perception of symptoms suggestive of visual and hearing impairment.

Girls, ethnic minorities, and schoolchildren in rural areas showed worse conditions in some of these risk factors. Many of these behaviors have deep roots in the structural social determinants of health inequalities, so their attention requires a multisectoral response to promote health and prevent the medium- and long-term effects on the health of Colombian schoolchildren.

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