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Adolescent injuries in Argentina, Bolivia, Chile, and Uruguay: Results from the 2012–2013 Global School-based Student Health Survey (GSHS)

Naja I. Beck, M.S., Issra Arif, M.S., Michelle F. Paumier, M.S., Kathryn H. Jacobsen, Ph.D.*

Department of Global & Community Health, George Mason University, United States

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ABSTRACT

Objectives: The goals of this study were to identify the proportion of early adolescents in southern South America who were injured in the past year, to identify risk behaviours and other exposures associated with injuries, and to evaluate the most common types and causes of injury in this population.
Methods: We used complex samples analysis to examine cross-sectional data from more than 35,000 students from all four countries in South America that participated in the Global School-based Student Health Survey (GSHS) in 2012–2013.
Results: The proportion of students reporting at least one injury in the past year that required medical treatment or caused at least one full day of missed school or usual activities was 27.1% in Argentina, 29.5% in Uruguay, 30.9% in Chile, and 36.8% in Bolivia. Significantly more boys than girls reported injuries. Injured students were more likely than non-injured students to report anxiety-induced insomnia, being physically attacked, being in a physical fight, and being lonely in the past year, and they were also more likely to report being bullied, using tobacco, drinking alcohol, and missing school in the past month. For both boys and girls, the most common type of injury reported was a broken bone or dislocated joint and the most common injury cause was the student falling. However, most students were not able to provide a specific answer to either question.
Conclusion: The GSHS has been conducted in 100 low- and middle-income countries and territories around the world, and new waves of data collection are currently being planned and implemented. The utility of the injury data from the GSHS would be improved if the injury type and cause response items were updated to better capture information about self-harm, sports injuries, and other statistics that will provide a stronger foundation for evidence-based injury prevention interventions in adolescent populations.

Introduction

Unintentional injuries and intentional self-harm are among the leading causes of disability among adolescents globally [1–5]. Injured adolescents may struggle with short- and long-term physical, cognitive, and psychological health issues after traumatic events, and they may also experience reduced school performance [6]. Most unintentional injuries are preventable. Among adolescents, risk-taking behaviours may be a significant contributor to the injury rate. The identification of the specific behaviours and exposures associated with injuries in various populations is an essential foundational step for the development and implementation of effective injury prevention education programs and other interventions [7].

This paper examines the injuries and injury-associated exposures and risk behaviours among middle and secondary school students in four countries in southern South America: Argentina, Bolivia, Chile, and Uruguay. Although these countries are regional neighbours, their socioeconomic profiles are not uniform (Table 1) [8,9]. Argentina, Chile, and Uruguay are all upper-middle income, mostly-urban countries. Bolivia is a lower-middle income, less-urbanized country that, correspondingly, has a lower life expectancy, a higher infant and child mortality rate, and a lower level of health access and spending than the other three countries. The countries also have different geographic and demographic profiles, with Argentina's population and land area

* Corresponding author at: Department of Global & Community Health, George Mason University, 4400 University Drive 5B7, Fairfax, Virginia, United States.
E-mail address: kjacobse@gmu.edu (K.H. Jacobsen).

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Table 1
Basic demographic, socioeconomic, and health indictors from the three study countries in 2012 (unless otherwise indicated) [8,9].

Country	Argentina	Bolivia	Chile	Uruguay
Land area (in km^2)	2,780,400	1,098,581	756,102	176,215
Total population (in millions)	41.1	10.5	17.5	3.4
Population aged under 15 (%)	24	35	21	22
Population living in urban areas (%)	93	67	89	93
Population using improved drinking water sources (%)	99	88	99	99
Population using improved sanitation (%)	97	46	99	96
Gross national income per capita (in US$)	11,364	2379	15,363	14,272
Life expectancy (in years) at birth	76	68	80	77
Healthy life expectancy (in years) at birth	67	59	70	68
Infant mortality rate per 1000 live births	13	33	8	6
Under-five mortality rate per 1000 live births	14	41	9	7
Hospital beds per 10,000 population (2006–2012)	47	11	21	25
Per capita total expenditure on health at average exchange rate (US$) (2011)	866	115	1022	1174
Per capita total expenditure on health (PPP int. $) (2011)	1393	248	1478	1294
Years of life lost per 100,000 population to all causes	18693	30515	13209	19426
Years of life lost per 100,000 population to injuries	2413	5488	2006	2575
% of years of life lost (YLL) attributable to injuries	12.9	18.0	15.2	13.3
Age-standardized mortality rates per 100,000 population from injuries	51	100	41	46

PPP int. $: purchasing power parity in international dollars.

more than ten times larger than those of Uruguay, and Bolivia and Chile in the middle.

The Global School-based Student Health Survey (GSHS), usually described in Spanish as the Encuesta Mundial de Salud Escolar (EMSE), is a youth health and risk behaviour study conducted in low- and middle-income countries around the world by national ministries of health and/or education with technical support from the World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC). Each country's GSHS questionnaire includes validated survey items selected from the ten core modules of the GSHS questionnaire bank: nutrition, physical activity, hygiene, mental health, alcohol use, tobacco use, drug use, sexual behaviours, violence/injury, and protective factors. This paper analyses data from all four of the South American countries that participated in the GSHS in 2012 (Argentina, Bolivia, and Uruguay) and 2013 (Chile), since all four of these countries opted to include questions about unintentional injuries in their country surveys. The specific aims of this analysis were (1) to calculate the prevalence of serious injuries among boys and girls attending secondary schools in southern South America, (2) to examine the behaviours associated with injuries in this population, and (3) to evaluate the most common types and causes of injuries that resulted in school absences and/or required medical treatment.

Methods

GSHS overview

GSHS data are collected from a nationally-representative sample of secondary school students after ethical approval and other permissions are granted by the relevant bodies, including the leaders of schools that have been sampled for inclusion in the national survey. Students who voluntarily consent to complete the survey record their own answers on a computer scannable form distributed by trained staff during one standard class period. No individually-identifiable information is collected. Approximately two years after the data are gathered, clean data files are made freely available to the public. These files contain weighting variables that account for the complex sampling method, but they do not include any individual- or school-level identifiers. Information about the sampling and participation rates is available from the final GSHS reports published by participating countries (Fig. 1).

Sampling

In all GSHS-participating countries, a two-stage approach is used to generate a nationally-representative sample of school-children in the grades that educate the majority of students who are in the target age ranges. Through 2012, the targeted age group for the GSHS was early adolescents ages 13–15 years. Beginning in 2013, the targeted age group expanded to include adolescents ages 13–17 years. In the first stage of the cluster sampling design, schools are randomly sampled from a list of all schools in the country using a probability proportionate to size (PPS) method. This method ensures that the participants represent the geographic diversity of the country. For example, Bolivia used a PPS approach that yielded sampled schools representing both public and private schools from urban and rural areas, and the final sample included schools from all nine of the country's departments and all three of its ecological zones [10]. In the second stage of the sampling process in each country, several classrooms that include high proportions of students from the targeted age groups are sampled for inclusion from within each of the participating schools. The grades sampled for participation in South America represented the eighth to tenth years of schooling or, for Chile, the

	Argentina	Bolivia	Chile	Uruguay
# of schools invited to participate	600	78	51	50
# (%) of participating schools	544 (91%)	77 (99%)	46 (91%)	50 (100%)
# (%) of participating students in participating schools	28,368 (79%)	3696 (89%)	2049 (67%)	3524 (77%)
Overall participation rate (%)	71%	88%	60%	77%

Fig. 1. Participants by country.