Oral Hygiene and Handwashing Practices among Middle School Students in 15 Latin American and Caribbean Countries

TR McKittrick, KH Jacobsen

ABSTRACT

Objective: *To examine the relationship between infrequent toothbrushing and infrequent handwashing among middle school students from 15 Latin American and Caribbean countries (Antigua and Barbuda, Argentina, British Virgin Islands, Cayman Islands, Costa Rica, Grenada, Guatemala, Guyana, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and Grenadines, Suriname, Trinidad and Tobago, and Uruguay).*

Methods: *A secondary analysis was done of nationally-representative data from 33 174 middle school students who participated in the Global School-based Student Health Survey (GSHS) between 2006 and 2011.*

Results: *In all 15 countries, the association between rarely brushing or cleaning teeth and rarely handwashing after using the toilet was significant for both boys and girls. The pooled odds ratio for this association was 6.7 (5.8, 7.7).*

Conclusion*: Healthcare providers who notice signs of poor dental hygiene or infrequent bathing in adolescents should consider providing comprehensive hygiene education to their patients, since infrequent oral and body hygiene behaviours tend to coexist and both are threats to health.*

Keywords: Adolescents, developing countries, handwashing, oral hygiene, toothbrushing

La Higiene Oral y las Prácticas de Lavado de Manos entre los Estudiantes de Secundaria en 15 Países de Latinoamérica y el Caribe

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RESUMEN

Objetivo: *Examinar la relación entre cepillado de dientes infrecuente y el infrecuente lavado de manos entre los estudiantes de secundaria de 15 países de América Latina y el Caribe (Antigua y Barbuda, Argentina, Islas Vírgenes Británicas, Islas Caimán, Costa Rica, Granada, Guatemala, Guyana, Perú, Saint Kitts y Nevis, Santa Lucía, Saint Vincent y Granadinas, Surinam, Trinidad y Tobago y Uruguay).*

Métodos: *Se realizó un análisis secundario de datos nacionalmente representativos de 33174 estudiantes de Encuesta Mundial de Salud a Escolares (GSHS) entre 2006 y 2011.*

Resultados: *En todos los 15 países, la asociación entre cepillarse o limpiarse raramente los dientes y lavarse raramente las manos después de usar el inodoro fue significativa para los varones y las hembras. El odds-ratio combinado (pOR) fue 6.7 (5.8, 7.7).*

Conclusión: *Los proveedores de salud que ven señales de una higiene dental pobre o falta de aseo en adolescentes deben considerar el proporcionar educación sanitaria integral a sus pacientes, ya que los*

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comportamientos de falta de higiene oral y corporal tienden a coexistir, y ambos constituyen amenazas para la salud.

Palabras claves: Adolescentes, países en desarrollo, lavado de manos, higiene bucal, cepillado de dientes

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INTRODUCTION

Cross-sectional studies from low- and middle-income countries (LMICs) have found that 5% to 10% of early adolescents in most countries report rarely or never brushing their teeth (1). About half of students in this age group may not always wash their hands before eating, after using the toilet, and in other circumstances (2). The goal of this analysis was to examine the relationship between self-reported oral and hand hygiene among middle school students in Latin America and the Caribbean (LAC).

SUBJECTS AND METHODS

The Global School-based Student Health Survey (GSHS) assesses the health behaviours of middle school children – roughly ages 13–15 years – in LMICs around the world. (For ease of reporting, countries and territories will be referred to as "countries" in this article.) We examined all 15 of the LAC countries that conducted national GSHS studies thus far. In each country, about 50 schools were randomly sampled for participation then classrooms from within these schools were sampled for inclusion. All students in sampled classrooms were invited to participate.

The GSHS has several limitations, including reliance on self-reported data and inclusion of only school-going adolescents. However, the use of standardized methods and survey questions by all GSHS participants provides a strong foundation for identifying and comparing the health behaviours and risks of early adolesents across the globe. This analysis examines the responses to two questions: "During the past 30 days, how many times per day did you usually clean or brush your teeth?" and "During the past 30 days, how often did you wash your hands after using the toilet or latrine?" Students who answered "I did not clean or brush my teeth during the past 30 days" or "Less than one time per day" to the oral hygiene question and those who answered "Never" or "Rarely" to the handwashing question were considered to practise infrequent hygiene.

We downloaded each country's data file from the US Centers for Disease Control and Prevention (CDC) website (http://www.cdc.gov/GSHS/) then analysed the datasets using SPSS (version 22). All counts reported in this paper are unweighted; proportions and odds ratios (ORs) are weighted to correct for differences between the study populations and each country's student populations. The weights for each country were provided with the datasets and were created using the same standardized GSHS methods.

Odds ratios for each country were calculated using multiple logistic regression models. In these models, an OR with a 95% confidence interval (95% CI) that does not overlap OR = 1 indicates a statistically significant association between infrequent toothbrushing and infrequent handwashing. Odds ratios much greater than OR = 1 indicate stronger magnitudes of association between those two variables. Since each participating country is an independent population, we were able to

Table: Odds ratios and 95% confidence intervals for the association between infrequent toothbrushing and handwashing

Country	Survey year	Number of participants	% who reported brushing or cleaning teeth less than daily over the past 30 days			% who reported never or rarely washing hands after using the toilet over the past 30 days			Age- and sex-adjusted OR (95% CI)
			Girls	Boys	*p*-value	Girls	Boys	*p*-value	
Antigua and Barbuda	2009	1266	1.9	3.8	**0.043**	5.0	4.7	0.660	**6.1 (2.6, 14.3)**
Argentina	2007	1980	6.5	11.7	**< 0.001**	5.7	8.1	**0.034**	**5.9 (3.9, 8.9)**
British Virgin Islands	2009	1664	3.8	3.1	0.402	3.2	4.0	0.339	**3.8 (1.5, 9.3)**
Cayman Islands	2007	1299	3.4	6.6	**0.007**	4.4	5.5	0.363	**7.5 (3.9, 14.5)**
Costa Rica	2009	2679	1.2	2.2	**0.041**	1.7	2.6	0.111	**6.8 (2.7, 17.1)**
Grenada	2008	1542	2.9	6.4	**0.001**	3.7	6.0	**0.042**	**4.1 (2.0, 8.5)**
Guatemala	2010	5592	3.0	5.3	**< 0.001**	2.1	4.7	**< 0.001**	**17.2 (12.2, 24.2)**
Guyana	2010	2392	3.9	5.1	0.162	5.9	6.9	0.320	**4.4 (2.7, 7.3)**
Peru	2010	2882	3.8	5.1	0.093	6.8	6.6	0.825	**4.0 (2.5, 6.3)**
Saint Kitts and Nevis	2011	1740	3.1	5.3	**0.022**	1.6	4.8	**< 0.001**	**5.6 (2.7, 11.7)**
Saint Lucia	2007	1276	2.4	4.4	**0.050**	3.6	5.3	0.145	**4.4 (1.8, 10.6)**
Saint Vincent and Grenadines	2007	1333	3.0	6.0	**0.008**	3.3	3.9	0.560	**3.8 (1.5, 9.5)**
Suriname	2009	1698	1.2	4.1	**< 0.001**	3.7	5.1	0.148	**4.7 (2.0, 10.8)**
Trinidad and Tobago	2007	2969	2.9	5.8	**< 0.001**	3.2	4.9	**0.018**	**7.6 (4.6, 12.3)**
Uruguay	2006	3406	1.1	3.5	**< 0.001**	3.9	6.8	**< 0.001**	**6.1 (3.5, 10.6)**

calculate a pooled OR (pOR) using meta-analysis software from MedCalc (version 13.1.0).

RESULTS

In total, 33 174 (98.4%) of the 33 718 students from 15 countries in the Americas who participated in the GSHS answered both hygiene questions (Table).

The overall prevalence of infrequent toothbrushing in these countries ranged from 2% to 9%. The prevalence of infrequent handwashing ranged from 2% to 7%. In 12 of the 15 countries, boys reported significantly less frequent toothbrushing than girls. Significant differences in handwashing behaviours by gender were reported for only six of the 15 countries.

After adjusting for age and gender, the point estimate of the odds ratios for the association between these two hygiene behaviours ranged from OR = 3.8 to OR = 17.2. Both the fixed-effects pOR [95% CI 6.7 (5.8, 7.7)] and the random-effects pOR [95% CI 6.2 (4.7, 8.3)] showed very significant associations between infrequent handwashing and infrequent toothbrushing (Figure). Gender-specified regression analyses also consistently showed a high magnitude of association between oral hygiene and hand hygiene for both boys and girls.

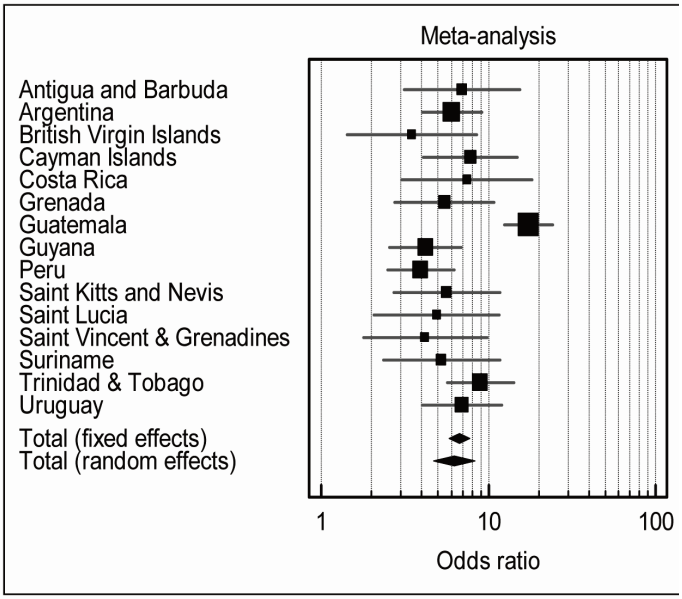

Figure: Odd ratios and 95% confidence intervals for the association between infrequent toothbrushing and handwashing.

DISCUSSION

Although the proportion of students practising infrequent oral and hand hygiene in each country was relatively small, the association between the two health behaviours was very strong. While boys were more likely than girls to infrequently clean their teeth and hands – a finding that is consistent with other studies of adolescent hygiene behaviours from high-income countries and LMICs (3, 4) – both boys and girls reported levels of infrequent hygiene that warrant attention.

Poor oral hygiene practices during adolescence increase the incidence of dental caries, an outcome that can lead to impaired adult health status as well as decreasing the quality of life during the teenage years (5, 6). Poor hand hygiene increases the risk of gastroenteritis (7). Any acute infection or chronic disease, including dental problems, may increase school absenteeism due to illness, pain, and the need to seek clinical care during school hours.

Student hygiene practices may be improved through school-based programmes that demonstrate proper hygiene techniques and schedule time during the school day for hygiene practices (8–10). Clinical professionals also have an important role to play in providing comprehensive hygiene education.

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