

## Physical Fighting and Social Correlates among In-School Adolescents in the Caribbean

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### Abstract

The aim of this study was to determine estimates of the prevalence and social correlates of physical fighting among adolescents in Caribbean countries. Cross-sectional national data from the Global School-based Health Survey (GSHS) included 11571 students primarily at the ages from 13 to 16 years from 7 Caribbean countries chosen by a two-stage cluster sample design to represent all students in Grades 6-10 in each country. Results indicate that, 28.6% of the adolescents had been in a fight 2 or 3 times or more in the past 12 months. Physical fighting was the highest in Jamaica (30.0%) and Antigua and Barbuda (29.8%) and the lowest in Dominica (21.1%) and St Lucia (23.3%). In multivariate logistic regression it was found that being male, risk behaviours (being bullied, smoking alcohol use and early sexual debut), suicide ideation and truancy were associated with physical fighting. Several clustering risk factors were identified which can be utilized in public health interventions.

**Keywords:** Physical fighting; Social correlates; School children; Antigua and Barbuda, Dominica, Grenada, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago

### 1. Introduction

The World Health Organization's 2002 World Report on Violence and Health identified youth violence as a global problem, with the highest youth homicide rates in Latin America, the Caribbean, the Russian Federation, and countries in southeastern Europe (Krug, Mercy, Dahlberg & Zwi, 2002). Halcón, Blum, Beuhring, Pate, Campbell-Forrester and Venema (2003) report on a survey among adolescents in nine Caribbean countries that 10.5% had been in a fight where weapons had been used and 7.1% ever rendered unconscious from violence. "For some adolescents, the threat of violence was woven deeply into their life experiences. Two out of 5 youths reported that sometimes or most of the time they think about hurting or killing someone else." (Halcón et al., 2003, p. 1852) In Jamaica, in a sample of primary school children, 58% had experienced moderate or high levels of different types of violence (Baker-Henningham, Meeks, Gardner, Chang & Walker, 2009). Violence among youth in Jamaica has been reported as a growing public health risk and challenge (Smith & Green, 2007).

The prevalence of any physical fighting in the past 12 months as found across 28 countries, among school-going adolescents was in the Eastern Mediterranean from 41.1% in Oman to 57.7% in Djibouti, in Asia from 15.9% in Myanmar to 50.0% in the Philippines, in sub-Saharan Africa from 28% in Swaziland to 53.5% in Ghana and in South America from 31.3% in Argentina to 40.7% in Chile (Swahn, Gressard, Palmier, Yao & Haberlen, 2013; Rudatsikira, Muula & Siziya, 2008), 31.4% in the USA (Swahn et al., 2013), and 33.8% in Portugal (Fraga, Ramos, Dias & Barros, 2011).

Factors associated with physical fighting among adolescents have been identified as follows: 1) Socioeconomic factors [male gender (Pickett et al., 2013; Rudatsikira, Siziya, Kazembe & Muula, 2007; Rudatsikira et al., 2008; Shetgiri, Kataoka, Ponce, Flores & Chung, 2010); older age (Pickett et al., 2013); low economic status (Bailey, 2011; Pickett et al., 2013; Shetgiri et al., 2010); 2) Risk behaviours (Pickett et al., 2013), substance use (alcohol use, smoking, drug use) (Fraga, Ramos, Dias & Barros, 2011; Reid, Garcia-Reid, Klein & McDougall, 2008; Rudatsikira et al., 2008, 2010; Shetgiri et al., 2010), bullying victimization (Celedonia, Wilson, El Gammal & Hagraas, 2013; Pickett et al., 2013; Rudatsikira et al.,

2007; Rudatsikira, Mataya, Siziya & Muula, 2008), early sexual debut (Fraga et al., 2011 ; Ohene, Ireland & Blum, 2005), drank more than five cans of soft drinks per week (Solnick & Hemenway, 2012); 3) Psychological distress [depressive symptoms (Celedonia et al., 2013; Shetgiri et al., 2010); feeling irritable or bad tempered (Smith-Khuri et al., 2004)]; 4) Lack of protective factors [lack of parental supervision (Rudatsikira et al., 2007, 2008), lack of helpful peers (Celedonia et al., 2013); lack of understanding parents (Celedonia et al., 2013), lack of family support (Shetgiri et al., 2010; Williams, Rivera, Neighbours & Reznik, 2007); lack of school support (Shetgiri et al., 2010; Williams et al., 2007).

There is a lack of recent national data regarding physical fighting and its social correlates among in-school adolescents in the Caribbean. Therefore, the aim of this study was to determine estimates of the prevalence and social correlates of physical fighting among adolescents in seven Caribbean countries.

## **2. Methods**

### *2.1 Participants and procedures*

This study involved secondary analysis of existing data from the Global School-Based Health Survey (GSHS) from seven Caribbean countries (Antigua and Barbuda, Dominica, Grenada, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago). Details and data of the GSHS can be accessed at <http://www.who.int/chp/gshs/methodology/en/index.html>. The GSHS school-based survey used a two-stage cluster sample design to collect data to represent all students in grades 6 to 10 in each country. At the first stage of sampling, schools were selected with probability proportional to their reported enrollment size. At the second stage, classes in the selected schools were randomly selected and all students in selected classes were eligible to participate irrespective of their actual ages. Students completed the self-administered questionnaire during one classroom period under the supervision of trained survey administrators and recorded their responses to each question on an answer sheet suitable for computerized scanning (CDC, 2013).

### *2.2 Measures*

The GSHS 10 core questionnaire modules address the leading causes of morbidity and mortality among children and adults worldwide; some include tobacco, alcohol and other drug use; dietary behaviours; mental health; physical activity; sexual behaviours that contribute to HIV infection, other sexually transmitted infections and unintended pregnancy; unintentional injuries and violence; protective factors and respondent demographics (CDC, 2013).

### *2.3 Physical fight.*

For the main outcome, study participants were asked, "During the past 12 months, how many times were you in a physical fight?" Response options ranged from "0 times", "1 time", "2 or 3 times", "4 or 5 times", "6 or 7 times", "8 or 9 times", "10 or 11 times" or "12 or more times". A physical fight was defined as "when two or more students of about the same strength and power choose to fight each other" (CDC, 2013). For the purpose of our analyses, participants were classified as having participated in a physical fight if they reported being in two or more fights (CDC, 2013).

### *2.4 Exposure to Bullying.*

To assess the exposure to a bullying behaviour, students were prompted with the following: "Bullying occurs when a student or group of students say or do bad and unpleasant things to another student. It is also bullying when a student is teased a lot in an unpleasant way or when a student is forced to withdraw from certain activities on purpose. It is not bullying when two students of about the same strength or power argue or fight or when teasing is done in a friendly and hilarious way." Students were then asked the following question: "During the past 30 days, on how many days were you bullied?" Response options ranged from 1 = 0 days to 7 =all 30 days. Those reporting one or more days were considered to have been bullied (CDC, 2013).

### *2.5 Hunger*

A measure of hunger was derived from a question reporting the frequency that a young person went hungry because there was not enough food at home in the past 30 days (response options were from 1 = never to 5 = always) (coded 1 =

most of the time or always and 0 = never, rarely or sometimes) (CDC, 2013).

## 2.6 Substance use variables

Smoking cigarettes: During the past 30 days, on how many days did you smoke cigarettes? (Response options were from 1=0 days to 7=all 30 days) (Coded 1=1 or 2 to all 30 days, and 0=0 days). Alcohol use: during the past 30 days, on how many days did you have at least one drink containing alcohol. Response options were from 1=0 days to 7=all 30 days; Coded 1=3-5 days to all 30 days, and 0=0 -1 or 2 days (CDC, 2013).

## 2.7 The sexual behaviour

The sexual behavior items of interest here were the following: 'Have you ever had sexual intercourse?' and 'How old were you when you had sexual intercourse for the first time?' (CDC, 2013) In this study, sexual debut at 14 years or younger was used to define early sexual debut (Woynarowska & Tabak, 2008).

## 2.8 Carbonated soft drinks

The consumption of *carbonated soft drinks* was assessed with the item, "During the past 30 days, how many times per day did you **usually** drink carbonated soft drinks (Do **not** include diet soft drinks.). Response options ranged from 1=I did not drink carbonated soft drinks during the past 30 days to 6=5 or more times per day (CDC, 2013).

## 2.9 Psychological distress

Psychological distress was assessed with 4 items. Loneliness: "During the past 12 months, how often have you felt lonely?" (Response options were from 1=never to 5=always) (Coded 1=most of the time or always and 0=never, rarely or sometimes). Suicide ideation: "During the past 12 months, did you ever seriously consider attempting suicide?" (Response option was 1=yes and 2=no, coded 1=1, 2=0). No close friends: "How many close friends do you have?" (Response options 1=0 to 4=3 or more). Anxiety or worried: During the past 12 months, how often have you been so worried about something that you could not sleep at night? (Response options were from 1=never to 5=always) (Coded 1= most of the time or always and 0=never, rarely or sometimes) (CDC, 2013).

## 2.10 Protective Factors

Protective factors were assessed with five items on school attendance, peer support at school, parental or guardian supervision, connectedness, and bonding. School attendance: "During the past 30 days, on how many days did you miss classes or school without permission? " (Response options were from 1 = 0 times to 5 = 10 or more times (coded 1= 0 times and 0=1 or 2 to 10 or more times). Peer support at school was assessed with the question "During the past 30 days, how often were most of the students in your school kind and helpful?" Parental or guardian supervision "During the past 30 days, how often did your parents or guardians check to see if your homework was done?" Parental or guardian connectedness "During the past 30 days, how often did your parents or guardians understand your problems or worries?" and Parental or guardian bonding "During the past 30 days, how often did your parents or guardians really know what you were doing with your free time?" Response options to these questions were from 1 = never to 5 = always, coded 1 = never or rarely and 0 = sometimes to always (CDC, 2013).

## 3. Data Analysis

Data analysis was performed using STATA software version 11.0 (Stata Corporation, College Station, Texas, USA). This software has the advantage of directly including robust standard errors that account for the sampling design, i.e. cluster sampling owing to the sampling of school classes. In further analysis, the physical fighting risk variable was recoded into two categories: no or once physical fighting (0); physical fighting at least 2 or 3 times in the past 12 months (1). Associations between potential risk factors and physical fighting among school children were evaluated calculating odds ratios (OR). Logistic regression was used for evaluation of the impact of explanatory variables on risk for physical fighting (binary dependent variable). The independent variable was at least twice or trice physical fighting, and the independent variables were factors which significantly increased physical fighting risk in the univariate analysis. For the individual risk

behaviour analyses, crude and adjusted odds ratios (ORs) and associated 95% confidence intervals were calculated for each level of exposure.

In the analysis, weighted percentages are reported. The reported sample size refers to the sample that was asked the target question. The two-sided 95% confidence intervals are reported. The p-value less or equal to 5% is used to indicate statistical significance. Both the reported 95% confidence intervals and the p-value are adjusted for the multi-stage stratified cluster sample design of the study.

## 4. Results

### 4.1 Sample characteristics

The sample included 11571 students at the ages primarily from 13 to 16 years from Caribbean countries; there were slightly more male (50.4%) than female students (49.6%) and the majority of the students (79.0%) were attending school grades 7 to 9. Data from the different countries had been selected from 2007 to 2010 (see Table 1). The overall response rate, a product of school and student response rates, varied from 67% in Antigua and Barbuda to 90% in Trinidad and Tobago.

**Table 1:** Sample response rate and age distribution of students surveyed: GSHS 2007-2010.

Country	Survey sample N	Survey year	Overall response rate* %	Age groups in years (%)				Boys in final sample %	Mean age of final sample Mean	Net primary school enrolment rate (WHO, 2013)	
				13 yrs or younger	14 yrs	15 yrs	16 yrs or more			Male %	Female %
Antigua and Barbuda	1186	2009	67.0	34.7	32.5	31.3	1.5	51.5	14.0	87	85
Dominica	1642	2009	84.0	37.4	19.6	23.1	19.9	51.2	14.1	96	97
Grenada	1542	2008	78.0	35.0	24.8	22.8	17.4	44.9	14.1	96	99
Jamaica	1623	2010	72.0	13.1	27.8	29.3	29.9	51.4	14.7	83	81
Saint Lucia	1276	2007	82.0	35.7	24.2	25.3	15.4	49.1	14.1	88	88
Saint Vincent and the Grenadines	1333	2007	84.0	48.9	26.5	16.4	8.3	47.3	13.7	100	97
Trinidad and Tobago	2969	2007	90.0	31.0	22.6	27.1	9.2	49.8	14.2	98	97
All	11571			21.8	25.9	27.9	24.4	50.4	14.5		

\*Overall response rate, the product of school and the student response rate

### 4.2 Descriptive results

Overall, 28.6% of the adolescents had been in a fight 2 or 3 times or more in the past 12 months, 46.7% had been in at least 1 physical fight in the past 12 months. Physical fighting (2 or 3 times or more in the past 12 months) was the highest in Jamaica (30.0%) and Antigua and Barbuda (29.8%) and the lowest in Dominica (21.1%) and St Lucia (23.3%), and in all countries physical fighting was more frequent among male than female students (see Table 2).

**Table 2:** Physical fighting among school going adolescents by country and gender

Country	Total	Male	Female	$\chi^2$
Antigua and Barbuda	29.8 (26.3-33.4)	38.6	20.0	P<0.001
Dominica	21.1 (18.5-23.8)	27.5	14.6	P<0.001
Grenada	25.2 (23.0-27.4)	36.9	15.5	P<0.001
Jamaica	30.0 (25.7-34.3)	34.6	24.4	P<0.001
Saint Lucia	23.3 (20.4-26.2)	31.0	17.2	P<0.001
Saint Vincent and the Grenadines	27.9 (23.4-32.3)	35.8	20.4	P<0.001
Trinidad and Tobago	27.3 (24.3-30.2)	39.1	16.3	P<0.001
All	28.6 (26.0-31.2)	35.8	20.7	P<0.001

### 4.3 Associations with physical fighting

In bivariate analysis, it was found that the frequent consumption of carbonated soft drinks was significantly associated with physical fighting. In multivariate logistic regression it was found that being male, risk behaviours (being bullied, smoking, alcohol use and early sexual debut), suicide ideation and truancy were associated with physical fighting (see Table 3).

**Table 3:** Logistic regression analysis for association between independent variables and physical fighting

Variables (%)	Crude Odds ratio (95% CI)	Adjusted Odds ratio (95% CI)
<i>Age in years</i>		
13 or less	1.00	
14	1.25 (0.90-1.72)	
15	0.95 (0.80-1.13)	
16 or more	1.07 (0.74-1.54)	---
<i>Gender</i>		
Female	1.00	1.0
Male	2.14 (1.79-2.56)***	2.64 (2.14-3.25)***
Hunger (7.2%)	1.77 (1.35-2.31)***	1.21 (0.74-1.99)
<i>Risk behaviour</i>		
Bullied (33.4%)	2.93 (2.51-3.42)***	1.72 (1.41-2.10)***
Current smoking (9.8%)	2.81 (2.24-3.52)***	1.88 (1.34-2.64)***
Current drinking (at least 3 days/month) (22.1%)	2.51 (1.90-3.32)***	1.91 (1.39-2.64)***
Early sexual debut (26.9%)	2.84 (2.42-3.33)***	1.69 (1.34-2.13)***
Carbonated soft drinks <sup>1</sup> (2 times of more per day) (44.8%)	1.75 (1.32-2.31)***	
<i>Psychological distress</i>		
Loneliness (14.7%)	1.36 (1.12-1.66)**	0.85 (0.64-1.12)
Anxiety or worried (12.5%)	1.64 (1.22-2.21)***	1.06 (0.74-1.50)
Suicide ideation (19.9%)	1.47 (1.14-1.90)**	1.66 (1.29-2.15)***
No close friend (10.5%)	1.00	1.00
One close friend (13.8%)	0.64 (0.42-0.97)*	0.90 (0.45-1.80)
Two or more close friends (75.8%)	0.82 (0.59-1.14)	1.18 (0.74-1.90)
<i>Protective factors</i>		
School attendance (72.8%)	0.43 (0.35-0.53)***	0.57 (0.42-0.76)***
Peer support (21.3%)	1.26 (1.03-1.54)*	0.99 (0.76-1.28)
Parental or guardian supervision (35.7%)	0.93 (0.68-1.27)	1.13 (0.83-1.55)
Parental or guardian connectedness (32.7%)	0.81 (0.70-0.93)**	0.88 (0.66-1.17)
Parental or guardian bonding (41.9%)	0.61 (0.49-0.76)***	0.88 (0.65-1.19)

The consumption of carbonated soft drinks was only assessed in three countries (Antigua-Barbuda, Dominica and Jamaica) and therefore not included in the multivariate model; \*\*\*P<.000, \*\*P<.01, \*P<.05

## 5. Discussion

In this study of in-school adolescents in 7 Caribbean countries using the Global School Health Survey of 2007-2010, a high percentage of adolescents (28.6% had been in a fight 2 or 3 times or more and 46.7% had been in at least 1 physical fight in the past 12 months). This figure compares with the prevalence of physical fighting in countries of the Eastern Mediterranean and sub-Saharan Africa, but is higher than in countries in South America, Asia and USA and Portugal (Fraga et al., 2011; Rudatsikira et al., 2008; Swahn et al., 2013). The study found some country variation in physical fighting prevalence, with Jamaica and Antigua and Barbuda having the highest and Dominica and St Lucia the lowest figures. Previous studies have also found high rates of interpersonal violence among high school students, adolescents and in the general population in Jamaica (Baker-Henningham et al., 2009; Gardner, Powell, Thomas & Millard, 2003; Le Franc, Samms-Vaughen, Hambleton, Fox & Brown, 2008; Soyibo & Lee, 2002). These country differences in the prevalence of physical fighting may be a product of certain cultural norms and practices that may contribute to or buffer against to the occurrence of physical fighting (Swahn et al., 2013; Smith-Khuri et al., 2004). Bailey (2011, p.165) notes that "in the Caribbean and in particular Jamaica is experiencing an epidemic of violence which adversely affects its youth who are the main perpetrators and victims. Early and protracted exposure to violence is part of

the socialization experience that results in violence-related behaviours."

In all study countries males were more likely to be engaged in physical fights than females, which concurs with previous studies (Pickett et al., 2013; Rudatsikira et al., 2007, 2008; Shetgiri et al., 2010). Some research has suggested that traditional masculine gender socialization and social and cultural norms encourage men to engage in behaviours that put their health at risk (Mahalik, Burns & Syzdek, 2007; Rudatsikira et al., 2007). This study, also found in agreement with other studies (Bailey, 2011; Pickett et al., 2013; Shetgiri et al., 2010) that hunger as an indicator of low economic status was associated with a higher risk of physical fighting. Lower levels of economic status may result in social conditions that promote the acceptance of violence within society (Pickett et al., 2013), and potential biological effects of hunger may lead to physiological changes such as cortisol fluctuations that associated with emotional stress may also contribute to violence (Pickett et al., 2013; Toda, Morimoto, Fukuda & Hayakawa, 2002).

We have found that having engaged in physical fighting was associated with other risk behaviours (smoking, alcohol use, early sexual debut and truancy). Other research (Sosin, Koepsell, Rivara & Mercy, 1995) indicated that fighting behaviour could be one of the most reliable makers of multiple problem behaviour. This clustering of unhealthy problem behaviours may suggest that adolescents who are likely to engage in physical fights are also likely to be involved in other problem behaviours (Rudatsikira et al., 2007). The study also found that adolescents who reported to have been bullied themselves were more likely to have engaged in physical fights. This finding concurs with previous studies (Celedonia et al., 2013; Pickett et al., 2013; Rudatsikira et al., 2007, 2008), and may indicate that adolescents that have been victims of some form of violence (bullying) may be at risk of being violent to others (Rudatsikira et al., 2007; Rudatsikira et al., 2007).

Further, the study found in bivariate analysis that the frequent consumption of carbonated soft drinks was associated with physical fighting, which has been confirmed in a previous study (Solnick & Hemenway, 2012). Solnick and Hemenway (16, p.259) note that, "There may be a direct cause-and-effect relationship, perhaps due to the sugar or caffeine content of soft drinks, or there may be other factors, unaccounted for in our analyses, that cause both high soft drink consumption and aggression." In bivariate analysis parental factors (connectedness and bonding) were, as found in other studies (Celedonia et al., 2013; Stetgiri et al., 2010; Swahn et al., 2013), were protective of physical fighting. This finding stresses the role of parental support in the prevention of adolescent violence. Family-based approaches that build relationships and parental monitoring skills may be indicated for the prevention of youth violence (Haegerich, Oman, Vesely, Aspy & Tolma, 2013).

## 6. Limitations of the Study

This study had several limitations. Firstly, the GSHS only includes adolescents who are in school. School-going adolescents may not be representative of all adolescents in a country as the prevalence of physical fighting and associated risk behaviour may differ between the two groups. Furthermore, this study was based on data collected in a cross sectional survey. We cannot, therefore, ascribe causality to any of the associated factors in the study. Another limitation may be that physical fighting was assessed with a single item in the GSHS, and contextual factors were not assessed (Swahn et al., 2013). Finally, the analysis was limited to, the risk factors included in the GSHS. There are some other potentially important risk and protective factors such as youth and parental attitudes toward fighting (Farrell, Bettencourt, Mays, Kramer, Sullivan & Kliever, 2012; Ohene, Ireland, McNeely & Borowsky, 2006; Solomon, Bradshaw, Wright & Cheng, 2008) that could be associated with the occurrence of physical fighting that were not measured.

## 7. Conclusion

In this study a high physical fighting prevalence was found among adolescents in seven Caribbean countries, which is comparable with several other regions in the world. The clustering of other risk behaviours such as smoking, alcohol use, early sexual debut, truancy and bullying victimization suggest that public health interventions aiming at the prevention of interpersonal violence in adolescents should factor in these other problem behaviours (Fraga et al., 2011).

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