Correlates of bullying victimization among school-going adolescents in Algeria: Results from the 2011 global school-based health survey

Abstract

Emmanuel Rudatskira,
Olusegun Babaniyi¹,
Seter Siziya²,
David Mulenga²,
Adamson S. Muula³,
Mazyanga L.
Mazaba-Liwewe⁴

Dean, School of Health Professions, Andrews University, Berrien Springs, Michigan, United States of America, ¹WHO Representative, World Health Organisation, Lusaka, Zambia, ²Department of Clinical Sciences, Copperbelt University, Ndola, Zambia, ³College of Medicine, University of Malawi, Blantyre, Malawi, ⁴Immune and Vaccine Preventable Diseases, World Health Organization, Lusaka, Zambia

Address for the Correspondence:

Mrs. Mazyanga Lucy Mazaba-Liwewe,
Department of Immune and Vaccine Preventable Diseases, World Health Organization, P.O. Box 32346, Lusaka, Zambia.
E-mail: mazmazli@yahoo.com

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Introduction: Literature establishes negative public health impact of bullying. Bullies and bully-victims are more likely to engage in a cluster of other delinquent behaviors. **Objectives:** The objective of this study was to determine correlates of bullying victimization among school-going adolescents in Algeria. **Materials and Methods:** The study analyzed data from the 2011 Global School-Based Health Survey conducted among in-school adolescents in Algeria. Logistic regression analyses were used to estimate associations between bullying victimization and selected variables. **Results:** A total of 4532 students participated in the survey of which 48.1% were males. Bullying victimization was estimated at 51.1% (47.2% among males and 54.9% among females). Males were 28% less likely to be bullied compared to females. Overall, adolescents aged < 13 years were 14% less likely to be bullied compared to those aged 16 years or older. Adolescents who reported hunger most of the time or always were 21% more likely to be bullied compared with those who were hungry less frequently. While students who smoked cigarettes were 24% more likely to report having been bullied, those who smoked marijuana were 21% less likely to report having been bullied compared to students who did not smoke. Adolescents who were involved in physical fighting were 67% more likely to be bullied compared to those who were not involved in fighting. While males who were involved in physical activity were 4% more likely to be bullied, females were 10% less likely to be bullied compared with adolescents who were not involved in physical activity. Sedentary students were 10% more likely to experience bullying victimization compared to those who did not have a sedentary lifestyle. **Conclusion:** Bullying victimization is frequent among Algerian in-school adolescents. This calls for a concerted effort to prevent and control bullying behavior using interventions that are gender sensitive.

Key words: Adolescents, Algeria, hunger, physical activity, physical fighting, sedentary behaviour, smoking cigarettes, smoking marijuana

INTRODUCTION

Bullying victimization is a major global adolescent health problem. Prevalence of bullying victimization varies within and between regions. In Africa, the highest prevalence of bullying among adolescents aged 13-15 years participating in the Global School-Based Health Survey (GSHS) was reported in Zambia (overall 65.1%, males 62.5% and females 67.1%) and the minimum in Tanzania (overall 27.8%, males 27.1% and females 28.5%). Meanwhile, the prevalence of being bullied in Algeria was 51.7% overall (48.1% of males and 55.1% of females).^[1]

Factors that were examined in the current study were identified from the literature as those that were significantly associated with bullying victimization and obtained in Global School Health Surveys. In a study involving 162,305 students aged 11, 13 and 15 years from 5998 schools in 35 countries in Europe and North America, Due *et al.*^[2] observed that adolescents from families of low affluence reported higher prevalence of being victims of bullying. In a study of bullying and substance use among 74,247 middle and high school students, Radliff *et al.*^[3] found that there was an evident link between involvement in bullying and substance abuse (cigarettes, alcohol and marijuana) with the bully-victims having the greatest levels of substance abuse. In Malawi, Kubwalo *et al.*^[4] reported a significant association between smoking cigarettes and

being bullied. Using pooled data from Kenya, Namibia, Morocco, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe, Brown *et al.*^[5] observed a significant relationship between physical fighting and being bullied. In a study in Namibia, Rudatsikira *et al.*^[6] reported that physical fighting (violent behavior) was associated with bullying victimization. Schoolchildren with sedentary habits (more than 3 h a day) were reported to be more likely victims of bullying.^[7]

Bullying victimization prevalence among Algerian adolescents is higher than in other settings partly because of the frequent unrests in Algeria. Community violence has the potential to influence victimizing behavior among adolescents.^[8] Hellman and Beaton^[9] found positive relationships between school violence and community crime rates. Furthermore, Everett and Price^[10] found that children from communities with higher crime rates were significantly more likely to be victims of an act of violence in and around school than other children. Traditionally girls did not attend schools, but now they comprise 38% of students in the secondary schools.^[11] This gender imbalance in school attendance might partly explain why adolescents in Algeria differ in their rates of bullying from those of the neighboring countries or elsewhere.

It is for the above reasons that among the many countries that recently conducted GSHS, we chose to conduct a study on bullying in Algeria. The only study we are aware of on bullying victimization in Algeria is the one that reported prevalence of bullying victimization among adolescents aged 13-15 years.^[1] Results from this study can only be generalized to this age group, and yet the participants in the survey were also younger than 13 years and older than 15 years. While determinants of bullying victimization have been studied in other North African countries, no such study has been conducted in Algeria. Hence, this study was conducted to estimate the prevalence of bullying victimization in Algeria and assess its relationship with selected variables.

MATERIALS AND METHODS

This study involved further analysis of data from the Algeria GSHS that was conducted in 2011. Further details of the GSHS methodology have been reported elsewhere.^[1] However, further details of the methodology pertaining to the Algeria GSHS are provided in this study.

Study area

With a total area of 2381,741 square km, Algeria is the 10th-largest country in the world, and the largest in Africa and in the Mediterranean. It has a population of 37.9 million of which 99% belong to the Islamic religion.^[11] The country is bordered in the Northeast by Tunisia, in the East by Libya, in the West by Morocco, in the Southwest by Western Sahara, Mauritania, and Mali, in the Southeast by Niger, and in the North by the Mediterranean Sea.

Sample selection and data collection

The 2011 Algeria School-based Student Health Survey enrolled students in grades 2nd-4th (the majority of students were aged 13-15 years old). A two-stage cluster sampling design was used to produce data representative of all students in grades 2nd-4th in Algeria. At the first stage, schools were selected with probability proportional to enrollment size. At the second stage, classes were randomly selected and all students in selected classes were eligible to participate. The overall response rate was 98% with school response rate at 100%, and student response rate at 98%. A total of 4532 students participated in the Algeria GSHS. Students self-reported their responses to each question on a computer scannable answer sheet.^[1]

Data analysis

Data analysis was conducted using Statistical package for Social Sciences (SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc.). The outcome variable was obtained from the following question: During the past 30 days, on how many days were you bullied? Those who reported having experience bullying for at least 1-day were categorized (Yes), and those who reported none were categorized (No). The explanatory variables were obtained from the following questions: During the past 30 days, how often did you go hungry because there was not enough food in your home? During the past 30 days, on how many days did you smoke cigarettes? During the past 30 days, how many times have you used marijuana (also called Chira)? During the past 12 months, how many times were you in the physical fight? During the past 7 days, on how many days were you physically active for a total of at least 60 min/day? How much time do you spend during a typical or usual day sitting or watching television, playing computer games, talking with friends or doing other sitting activities such as surfing the internet? as shown in Figure 1.

A weighting factor was used in the analysis to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of nonresponse. The weight that was used for estimation is given by the following formula:

$$W = W1 \times W2 \times f1 \times f2 \times f3 \times f4,$$

where,

W1 = The inverse of the probability of selecting the school

W2 = The inverse of the probability of selecting the classroom within the school

f1 = A school-level nonresponse adjustment factor calculated by school size category (small, medium, large)

f2 = A class-level nonresponse adjustment factor calculated for each school

f3 = A student-level nonresponse adjustment factor calculated by class

f4 = A poststratification adjustment factor calculated by grade

Logistic regression analysis was carried out to assess the associations of cigarette and marijuana smoking with bullying victimization.

Figure 1: Description of variables

Variable	Description/question	Coded	Recoded
Dependent			
Bullied=Q34 [QN20]	During the past 30 days, on how many days were you bullied? 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 left out of things 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 fun way	1=0 day 2=1 or 2 days 3=3-5 days 4=6-9 days 5=10-19 days 6=20-29 days 7=All 30 days	1=1-30 days (yes) 0=0 days (no)
Independent			
Age=Q1	How old are you?	1=11 years old or younger 2=12 years old 3=13 years old 4=14 years old 5=15 years old 6=16 years or older	1=12 years or younger 2=13 years 3=14 years 4=15 years 5=16 years or older
Sex=Q2	What is your sex?	1=Male 2=Female	1=Male 2=Female
Hunger=Q6 [QN6]	During the past 30 days, how often did you go hungry because there was not enough food in your home?	1=Never 2=Rarely 3=Sometimes 4=Most of the time 5=Always	1=Most of the time or always (yes) 2=Never, rarely or sometimes (no)
Physical fight=Q29 [QN16]	During the past 12 months, how many times were you in a physical fight?	1=0 time 2=1 time 3=2 or 3 times 4=4 or 5 times 5=6 or 7 times 6=8 or 9 times 7=10 or 11 times 8=12 or more times	1=1 or more times (yes) 2=0 time (no)
Smoke cigarettes=Q41 [QN29]	During the past 30 days, on how many days did you smoke cigarettes?	1=0 day 2=1 or 2 days 3=3-5 days 4=6-9 days 5=10-19 days 6=20-29 days 7=All 30 days	1=1 or more days (yes) 2=0 day (no)
indcUsed marijuana=Q57 [QN42]	During the past 30 days, how many times have you used marijuana (also called Chira)?	1=0 time 2=1 or 2 times 3=3-9 times 4=10-19 times 5=20 or more times	1=1 or more times (yes) 2=0 time (no)
Physically active=Q67 [QN49]	During the past 7 days, on how many days were you physically active for a total of at least 60 min per day?	1=0 day 2=1 day 3=2 days 4=3 days 5=4 days 6=5 days 7=6 days 8=7 days	1=5-7 days (yes) 2=<5 days (no)
Sedentary behavior=Q71 [QN52]	How much time do you spend during a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities, such as surfing the internet?	1=<1 h 2=1 or 2 h 3=3 or 4 hours 4=5 or 6 hours 5=7 or 8 hours 6=More than 8 hours	1=3 or more hours (yes) 2=<3 (no) hours

Ethical considerations

The data set and code book were made available to the public on the GSHS website.^[12] No school identifier was included in the data that was deposited in the public domain. Students were informed

not to write their names on the answer sheet and that the answers they gave were kept confidential. They were further informed that completing the survey was voluntary and that grades or marks in the class would not be affected whether or not they answered the

questions. Students were also told that if they did not want to answer the question, they would leave it blank.

RESULTS

A total of 4532 students participated in the survey of which 48.1% were males. Male students tended to be older than female students ($P < 0.001$). Overall 8.5% of students (8.6% of males and 8.2% of females) went hungry because there was not enough food in the home, 9.5% of the students (18.5% of males and 1.3% of females) currently smoked cigarettes, and 2.2% of students (4.0% of males and 0.4% of females) smoked marijuana. About one in two participants (47.8%) reported having been involvement in physical fighting (61.3% of males and 35.5% of females). More than one in four participants (27.1%) reported sedentary lifestyle, while 21.1% were physically active. These results are shown in Table 1.

Age, sex, hungry, smoking cigarettes, smoking marijuana, engaging in the physical fight, being physically active and sedentary lifestyle were significantly associated with bullying victimization [Tables 2 and 3].

Table 1: Sample description of students who participated in the 2011 Algeria GSHS

Factor	Total <i>n</i> * (%)**	Males <i>n</i> * (%)**	Females <i>n</i> * (%)**
Age (years)			
<13	680 (21.2)	277 (16.8)	381 (24.4)
13	867 (18.3)	398 (17.9)	466 (18.8)
14	953 (18.3)	411 (17.8)	539 (19.0)
15	1108 (23.5)	541 (24.2)	564 (23.3)
16+	881 (18.7)	509 (23.3)	365 (14.5)
Sex			
Male	2150 (48.1)	—	—
Female	2360 (51.9)		
Hunger			
Yes	389 (8.5)	195 (8.6)	186 (8.2)
No	4121 (91.5)	1944 (91.4)	2130 (91.8)
Cigarette smoking			
Yes	403 (9.5)	370 (18.5)	33 (1.3)
No	4028 (90.5)	1751 (81.5)	2277 (98.7)
Marijuana smoking			
Yes	73 (2.2)	63 (4.0)	8 (0.4)
No	4408 (97.8)	2052 (96.0)	2303 (99.6)
Physical fight			
Yes	2145 (47.8)	1299 (61.3)	822 (35.5)
No	2348 (52.2)	831 (38.7)	1485 (64.5)
Physically active			
Yes	941 (21.1)	671 (31.3)	253 (11.5)
No	3544 (78.9)	1455 (68.7)	2051 (88.5)
Sedentary			
Yes	1181 (27.1)	600 (29.4)	567 (25.1)
No	3300 (72.9)	1525 (70.6)	1739 (74.9)
Bullied			
Yes	2262 (51.1)	1006 (47.2)	1235 (54.9)
No	2115 (48.9)	1069 (52.8)	1016 (45.1)

**n* = Unweighted frequencies (%), **Weighted percentages, GSHS = Global School-Based Health Survey

Overall, adolescents aged <13 years were 14% (adjusted odds ratio [AOR] = 0.86, 95% confidence interval [CI] [0.85, 0.87]) less likely to be bullied compared to those aged 16 years or older. While males aged 13 and 15 years were more likely to be bullied (AOR = 1.31, 95% CI [1.30, 1.32] for age 13 years and AOR = 1.03, 95% CI [1.03, 1.04] for age 15 years), females of the same ages were equally likely to be bullied compared to those aged 16 years or older. While among males, those aged 14 years were 8% less likely to be bullied (AOR = 0.92, 95% CI [0.91, 0.93]), females of the same age were equally likely to be bullied compared to those aged 16 years or older. Males were 28% (AOR = 0.72, 95% CI [0.72, 0.72]) less likely to be bullied compared to females.

In general, students who were hungry most of the time or always were 21% (AOR = 1.21, 95% CI [1.20, 1.21]) more likely to be bullied compared to those who went hungry for less frequent times (AOR = 1.40, 95% CI [1.39, 1.41] for males and AOR = 1.06, 95% CI [1.05, 1.07] for females).

Overall, students who smoked cigarettes were 24% (AOR = 1.24, 95% CI [1.24, 1.25]) more likely to report having been bullied compared with those who did not smoke cigarettes (AOR = 1.29, 95% CI [1.28, 1.29] for males and AOR = 1.16, 95% CI [1.14, 1.19] for females), while students who smoked marijuana were

Table 2: Correlates for bullying victimization in univariate logistic regression analyses

Factor	Total OR* (95% CI)**	Males OR* (95% CI)**	Females OR* (95% CI)**
Age (years)			
<13	0.89 (0.89, 0.90)	0.84 (0.83, 0.85)	0.88 (0.87, 0.88)
13	1.09 (1.08, 1.10)	1.17 (1.15, 1.18)	1.02 (1.01, 1.03)
14	0.98 (0.97, 0.98)	0.89 (0.88, 0.90)	1.02 (1.01, 1.03)
15	1.03 (1.02, 1.03)	1.06 (1.05, 1.08)	0.97 (0.96, 0.97)
16+	1	1	1
Sex			
Male	0.86 (0.85, 0.86)	—	—
Female	1		
Hunger			
Yes	1.24 (1.23, 1.24)	1.36 (1.35, 1.37)	1.09 (1.08, 1.09)
No	1	1	1
Smoking cigarettes			
Yes	1.27 (1.26, 1.27)	1.40 (1.39, 1.41)	1.40 (1.37, 1.43)
No	1	1	1
Smoking marijuana			
Yes	1.05 (1.04, 1.06)	1.08 (1.06, 1.09)	0.95 (0.92, 0.99)
No	1	1	1
Physical fight			
Yes	1.54 (1.54, 1.54)	1.65 (1.64, 1.66)	1.70 (1.69, 1.71)
No	1	1	1
Physically active			
Yes	0.95 (0.95, 0.96)	1.07 (1.06, 1.07)	0.90 (0.90, 0.91)
No	1	1	1
Sedentary			
Yes	1.12 (1.11, 1.12)	1.09 (1.08, 1.09)	1.17 (1.17, 1.18)
No	1	1	1

*OR = Odds ratio, **CI = Confidence interval

Table 3: Correlates for bullying victimization in multivariate logistic regression analyses

Factor	Total AOR* (95% CI)**	Males AOR* (95% CI)**	Females AOR* (95% CI)**
Age (years)			
<13	0.86 (0.85, 0.87)	0.84 (0.83, 0.85)	0.88 (0.87, 0.89)
13	1.12 (1.12, 1.13)	1.31 (1.30, 1.32)	0.99 (0.98, 1.00)
14	0.97 (0.97, 0.98)	0.92 (0.91, 0.93)	1.00 (0.99, 1.01)
15	1.02 (1.02, 1.03)	1.03 (1.03, 1.04)	1.00 (0.99, 1.01)
16+	1	1	1
Sex			
Male	0.72 (0.72, 0.72)	—	—
Female	1		
Hunger			
Yes	1.21 (1.20, 1.21)	1.40 (1.39, 1.41)	1.06 (1.05, 1.07)
No	1	1	1
Smoking cigarettes			
Yes	1.24 (1.24, 1.25)	1.29 (1.28, 1.29)	1.16 (1.14, 1.19)
No	1	1	1
Smoking marijuana			
Yes	0.79 (0.78, 0.80)	0.82 (0.81, 0.83)	0.62 (0.60, 0.65)
No	1	1	1
Physical fight			
Yes	1.67 (1.66, 1.67)	1.65 (1.65, 1.66)	1.70 (1.70, 1.71)
No	1	1	1
Physically active			
Yes	0.98 (0.97, 0.98)	1.04 (1.03, 1.04)	0.90 (0.89, 0.90)
No	1	1	1
Sedentary			
Yes	1.10 (1.10, 1.11)	—	1.19 (1.19, 1.20)
No	1		1

*AOR = Adjusted odds ratio, **CI = Confidence interval

21% (AOR = 0.79, 95% CI [0.78, 0.80]) less likely to be bullied compared to students who did not smoke marijuana (AOR = 0.82, 95% CI [0.81, 0.83] for males and AOR = 0.62, 95% CI [0.60, 0.65] for females). Respondents who reported involvement on physical fighting were 67% (AOR = 1.66, 95% CI [1.66, 1.67]) more likely to report bullying victimization than those who were not engaged in physical fighting (AOR = 1.65, 95% CI [1.65, 1.66] for males and AOR = 1.70, 95% CI [1.70, 1.71] for females). Physically active males were more likely to be experience bullying victimization (AOR = 1.04; 95% CI [1.03, 1.04]), while it was the opposite for females (AOR = 0.90, 95% CI [0.89, 0.90]). Sedentary students were 10% more likely to experience bullying victimization (AOR = 1.10, 95% CI [1.10, 1.11]).

DISCUSSION

In a nationwide survey of school-based adolescents in Algeria, 51.1% reported having been bullied in the past month. This prevalence is <60% reported in Egypt, but higher than in Tunisia, Morocco, and Libya, where one-third of the respondents reported having been bullied in the last 30 days.^[3]

While the association between age and bullying victimization appear to be inconsistent, overall, adolescents aged <13 years were less likely

to be bullied. The results for those aged between 13 and 15 years were different between sexes. Younger age has been associated with bullying victimization.^[13,14] However, it is not clear why males aged 13 or 15 years were more likely to be bullied, while those aged 14 years were less likely to be bullied compared to those aged 16 years or older. Similarly, it is not clear why females aged 13 or 14 years were equally likely to be bullied, while those aged 15 years were less likely to be bullied compared to those aged 16 years or older.

In this study, male respondents were less likely to have been bullied than females. This is contrary to previous reports from Morocco, Egypt, Tunisia, and Libya where boys were more likely to report bullying experience than girls.^[3] There is no consistency in the findings from previous studies on gender difference in bullying victimization. In Malawi, Kubwalo *et al.*^[4] reported no gender difference in the prevalence of bullying victimization while in the neighboring country of Zambia and in other counties such as Turkey, Israel and Spain, males were more likely to report bullying victimization than females.^[15-18] In a cross-national profile of bullying and victimization among adolescents in 40 countries, Craig *et al.*^[19] found that girls, in the majority of countries in the Northern hemisphere, were more likely to report higher levels of victimization than boys and that this pattern was relatively similar for each age group. Differences in culture on how boys and girls relate to each other may partly explain the different levels of bully victimization in the above studies. In Algeria, while girls in Algeria are taught to be obedient to all males, boys are taught that the primary function of girls and women is to attend to the males' needs and desires.^[11]

The current study did not have good indicators to measure economic status of the participants. A proxy for a measure of economic status used in the study was obtained by determining how often participants went hungry because there was not enough food in your home. Participants who reported going hungry most of the time or always were more likely to be bullied compared to participants who reported never, rarely or sometimes went hungry. A similar finding using data from 162,305 students aged 11, 13 and 15 years from nationally representative samples from 5998 schools in 35 countries in Europe and North America was reported by Due *et al.*^[2] who observed that participants of greater socioeconomic disadvantage were at higher risk of being victims of bullying, although no significant association was observed between bullying and the economic level of the country of residence or of the school attended.

In our study, individuals who smoked cigarettes were more likely to report being bullied than those who did not smoke cigarettes. This is consistent with previous studies, which have reported a positive association between being bullied and smoking cigarettes in countries such as Italy and Venezuela.^[19,20] The deviant behavior of adolescents who smoked cigarettes might not have been accepted by their colleagues or adults, thus subjecting them to several forms of bullying such as ridicule. However, it is possible that bullying victimization might have led the victims to smoke cigarettes. With cross sectional studies, it is not possible to ascribe causation in any observed association.

Participants who reported being involved in physical fighting were more likely to experience bullying victimization. Pengpid and Peltzer^[21] reported similar findings from Thailand. Sedentary lifestyle was associated with bullying victimization. In a study of associations of school violence with physical activity among US High school students, Demissie *et al.*^[22] found that bullying victimization was negatively associated with daily physical activity and sports participation.

Study participants who reported smoking marijuana were less likely to be bullied than those who did not smoke marijuana. This is contrary to previous studies.^[3,15,18] In a study conducted in Zambia on cannabis use and its socio-demographic correlates among in-school adolescents in Zambia, Siziya *et al.*^[23] reported that adolescents who used cannabis were more likely to have been bullied than those who did not use cannabis. Garcia-Contenente *et al.*^[18] reported similar findings from Spain. We have no explanation as to why those who reported smoking marijuana were less likely to be bullied than those who did not smoke marijuana. We speculate that those who smoked marijuana may have been bullies instead of victims of bullying.

Although our study has strengths such as a large sample size, it has also some limitations. Firstly, the data used in the analysis was collected through self-reports. Therefore, there may be either deliberate or inadvertent misreporting. Furthermore, the study enrolled only in-school students, which means that its results cannot be generalized to all Algerian adolescents. Out of school adolescents may have different prevalence rates of smoking and bullying and patterns of association. The prevalence of bullying may have been overestimated because bullying included cases that were bullied only once in the previous 30 days as in most studies on bullying in Africa.

CONCLUSION

We found that bullying victimization is frequent among Algerian in-school adolescents. Age, sex, hungry, smoking cigarettes, smoking marijuana, engaging in the physical fight, being physically active and sedentary lifestyle were significantly associated with bullying victimization. That the association between smoking cigarette and bullying victimization is different from that between marijuana smoking deserves further study. There is a need for a concerted effort to prevent and control bullying behavior.

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