

# Injuries, Violence, and Bullying Among Middle School Students in Oman

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## ARTICLE INFO

### Article history:

Received: 17 May 2016

Accepted: 12 October 2016

### Online:

DOI 10.5001/omj.2017.19

### Keywords:

Wounds and Injuries; Violence; Bullying; Adolescents; Middle East.

## ABSTRACT

**Objectives:** Injuries account for a substantial proportion of the burden of disease in adolescents globally. This paper describes injury rates and associated exposures, and risk behaviors in Oman's 2010 Global School-based Student Health Survey (GSHS).

**Methods:** This study used complex samples analysis to examine nationally-representative data from 1 606 students in grades eight, nine, and 10 who participated in the 2010 Oman GSHS. **Results:** In total, 34.0% of the students reported having at least one injury in the past year that caused at least one full day absence from usual activities or required medical treatment. The most common injury type reported was a broken bone or dislocated joint. The most common injury cause was falling. Additionally, 38.4% of the students reported being bullied in the past month, 38.8% reported being physically attacked in the past year, and 47.6% reported being in physical fights. Both injured boys and girls reported experiencing significantly more bullying, fights, and attacks (odds ratio > 2) than their non-injured classmates, even though only 9.6% of injured students reported that their most serious injury in the past year was the result of an assault, and students reporting assaults did not have significantly higher odds of exposure to these types of peer violence. More than half of the bullied students reported that the most frequent type of peer victimization they experienced was being made fun of with sexual jokes, comments, or gestures. Sexual bullying was the most common type of bullying reported by girls and boys. **Conclusions:** Promoting healthier peer relationships may help to reduce injuries in this age group as well as reducing the harmful effects of bullying.

Unintentional injuries such as fractures, concussions, open wounds, and burns are a common cause of morbidity and disability among adolescents worldwide.<sup>1–3</sup> Adolescent injuries may have social, behavioral, and economic consequences for the injured children as well as their families.<sup>4</sup> Unintentional injury morbidity and mortality rates are high in the Middle East compared to global averages, and injuries are a common contributor to daily-adjusted life years (DALYs) in the region.<sup>3,5</sup> This paper describes injury rates and associated exposures, and risk behaviors in Oman's 2010 Global School-based Student Health Survey (GSHS).

The GSHS is a youth risk behavior survey sponsored by the World Health Organization (WHO) that is conducted primarily in low- and middle-income countries (LMICs), although some high-income countries like Oman have opted to participate. The Health Behaviour in School-aged Children (HBSC) study, also WHO-supported, uses methods similar to the GSHS, but is usually implemented in high-income countries (HICs).

GSHS- and HBSC-participating countries report widely different injury rates among early adolescents.<sup>6–16</sup> Thus, there is a need for additional country-level studies to evaluate injury rates, types, and causes among adolescents, especially in the Middle East region. In particular, the suggested links between injuries, physical fights and attacks, and various types of bully victimization in a few previous GSHS analyses merit further examination.<sup>8,11,12</sup>

The specific objectives of this new analysis of GSHS data from Oman were: to determine the prevalence of serious injuries in the past year among middle school students in Oman in 2010, to examine the relationships between physical fights, physical attacks, and injuries among these students, and to investigate the association between victimization by a peer bully, forms of bullying experienced, and injuries among participants.

## METHODS

Oman's Ministry of Health and Ministry of Education co-sponsored the 2010 GSHS, and

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both approved the research protocol prior to its implementation. The research protocol was also approved by the ethics review committees of the WHO and the US Centers for Disease Control and Prevention (CDC), which provided technical support for the study. All GSHS surveys use a two-stage cluster sampling technique to sample a representative subset of middle school students from across the country. In Oman, 49 schools from across the nation were randomly sampled from a list of all schools containing grades eight, nine, and 10; 46 (94%) of these schools agreed to participate.<sup>17</sup> Classrooms of students in grades eight, nine, and 10 from these participating schools were then randomly sampled for participation using a probability proportional to size approach.

All students in sampled classrooms were invited to participate in the GSHS. Students were informed that "Completing the survey is voluntary. Your grade or mark in this class will not be affected whether or not you answer the questions. If you do not want to answer a question, just leave it blank." Consenting volunteers completed questionnaires in March or April 2010 during school hours using a self-report computer-scannable form. All survey items used in the 2010 Oman GSHS were selected from a standardized and validated GSHS question bank and translated from English to Arabic. All responses were anonymous, and no identifiable information was collected. In total, 94% of the students in sampled classrooms completed the survey, for an overall student participation rate of 89% among all sampled schools.<sup>17</sup> Anonymized data were made available to the public two years after they were collected.

The 2010 Oman GSHS survey instrument provided a definition of qualifying injuries: "An injury is serious when it makes you miss at least one full day of usual activities (such as school, sports, or a job) or requires treatment by a doctor or nurse." Three questions about injuries were asked: (1) the frequency of serious injuries during the past year ("During the past 12 months, how many times were you seriously injured?"); (2) the type of injury that was most severe during the past year ("During the past 12 months, what was the most serious injury that happened to you?"); and (3) the cause of the most serious injury ("During the past 12 months, what was the major cause of the most serious injury that happened to you?"). Both the type and cause questions included a list of close-ended responses

along with an "I was not seriously injured during the past 12 months" response option.

There were 1 606 participants included in the public dataset, of whom 1 505 (93.7%) answered at least one of the three questions and were therefore able to be coded for an injury status. Because the responses to the frequency question were grouped (for example, as "2 or 3 times" and "4 or 5 times"), it is not possible to determine the total number of injuries sustained by the study population during the year prior to the survey. This means that the incidence rate for injuries cannot be calculated. Instead, we present the percentage of students reporting at least one serious injury in the past year, which is a type of prevalence rate. We cleaned the injury data in several steps. First, all students who answered the frequency question were assigned an injury status based on that response. Second, any student coded as injured based on the frequency question who indicated no injury in both the type and cause questions was recoded as not injured. Similarly, any student coded as uninjured who specified an injury type and cause was recoded as injured. Third, any student who did not answer the frequency question but answered one or both of the type and cause questions was assigned an injury status based on those answers. We then cleaned the type and cause variables. Any injured student missing an answer to either question had that missing response coded as "Other." We also recoded a few injury types and causes as "Other" for internal consistency.

The Oman GSHS questionnaire defined a physical attack as occurring "when one or more people hit or strike someone, or when one or more people hurt another person with a weapon (such as a stick, knife, or gun)" adding that "it is not a physical attack when two students of about the same strength or power choose to fight each other." Physical fighting was defined as occurring "when two students of about the same strength or power choose to fight each other."

Bullying in the Oman GSHS questionnaire was defined as occurring "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 way." Two questions about bullying asked about the

frequency of victimization in the past 30 days and the type of bullying experienced most often during those 30 days. Students who indicated that they had been bullied on one or more days but who answered the question about bullying type with “I was not bullied during the past 30 days” were considered not to have been victimized by a peer. Those who said they were bullied on 0 days in the past month but listed a type of most frequent bullying were recoded to indicate that they had been bullied.

Data were analyzed using the complex samples functions in Epi Info™ and a significance level of  $\alpha = 0.05$ , according to the methods spelled out in the GSHS Data User's Guide.<sup>18</sup> The counts reported in this paper are unweighted, but all percentages and statistical tests are adjusted with the three weighting variables (primary sampling unit, stratum, and weight) provided with the dataset to account for the two-step sampling method and to adjust for minor demographic differences between the study population and the national student population as a whole. Odds ratios (OR) and their associated 95% confidence intervals (CI) were used to compare injury rates by sex, age, and other characteristics.

## RESULTS

In total, 34.0% of the 1 505 students who were able to be coded for an injury status reported sustaining one or more serious injuries in the past year. Boys were more likely than girls to report having had a serious injury (40.2% vs. 26.8%), but injury rates did not differ significantly by age [Table 1].

Boys and girls reported similar rates of being physically attacked in the past year (40.1% vs. 36.4%), but boys were more likely than girls to report

being in a physical fight in the past year (51.0% vs. 43.3%).

The most common types of serious injuries reported were broken bones and dislocated joints (23.6% of injured students), cuts and stab wounds (23.7%), and concussions or other head or neck injuries, being knocked out, or having breathing difficulties associated with an injury (9.1%) [Table 2]. The types of injuries differed significantly by sex. Boys were significantly more likely than girls to have a broken bone or dislocation (30.5% vs. 12.6%). However, 39.3% of injured students did not specify the type of injury, with injured girls more likely than injured boys not to report a specific injury type (46.8% vs. 35.6%). The most common causes of injuries among those with a serious injury were falling (26.2%), something falling on or hitting the student (13.1%), being in a motor vehicle accident or being hit by a motor vehicle (10.3%), and being attacked or abused or fighting with someone (9.6%) [Table 2].

The risk behaviors and exposures with the strongest associations with serious injuries are presented separately for boys and girls in Table 3. For all students combined, the strongest associations were being bullied (OR = 3.1; 95% CI 2.4, 4.0), being in a physical fight (OR = 2.3; 1.8, 2.9), and being attacked (OR = 2.3; 1.8, 2.9). Although these types of violence were associated with increased odds of injury, exposure to peer violence was not strongly associated with assault injuries. When comparing injured students whose most serious injury in the past year was caused by an assault to other injured students, the odds of victimization by a bully (OR = 1.7; 0.9, 3.5), fighting (OR = 1.8; 0.8, 3.9), and assault (OR = 1.7; 0.8, 3.7) were not statistically

**Table 1:** Participant characteristics. Proportions were weighted to account for differences between participants and the Oman middle student population as a whole.

Characteristics	Total	Sex		OR (95% CI)	Age, years				
		Boys	Girls		12	13	14	15	16
<b>Participants</b>									
n (unweighted)	1606	735	830	-	26	152	367	470	557
% (weighted)	100.0	51.7	48.3	-	1.7	9.5	24.0	33.4	31.4
Seriously injured in the past year	34.0	40.2	26.8	1.8 (1.4, 2.4)	42.6	32.9	34.3	35.2	33.0
Physically attacked in the past 12 months	38.8	40.1	36.4	1.2 (0.9, 1.5)	51.7	40.7	45.4	37.4	33.9
In a physical fight in the past 12 months	47.6	51.0	43.3	1.4 (1.1, 1.8)	56.1	48.0	55.7	46.5	41.4
Bullied in the past 30 days	38.4	37.8	38.8	1.0 (0.7, 1.3)	33.0	34.9	36.1	39.5	40.1

OR: odds ratio; CI: confidence interval.

**Table 2:** Injuries experienced during the past 12 months among students who reported having a serious injury.

Injuries	Total, %	Boys, %	Girls, %
<b>Most serious injury type (among those with a serious injury)</b>			
Broken bone or dislocated joint	23.6	30.5	12.6
Cut or stab wound	23.7	24.0	22.4
Concussion or other head or neck injury, was knocked out, or could not breathe	9.1	7.7	10.4
Gunshot wound	1.3	1.2	1.6
Bad burn	1.9	1.0	3.4
Poisoned or took too much of a drug	1.1	0.0	2.9
Other / type not specified	39.3	35.6	46.8
<b>Cause of the most serious injury (among those with a serious injury)</b>			
I fell	26.2	28.2	23.6
Something fell on me or hit me	13.1	12.4	14.3
I was in a motor vehicle accident or hit by a motor vehicle	10.3	13.1	5.9
I was attacked or abused or was fighting with someone	9.6	8.2	11.8
I inhaled or swallowed something bad for me	2.6	2.1	3.0
I was in a fire or too near a flame or something hot	2.1	1.6	2.9
Other / cause not specified	36.2	34.4	38.4

**Table 3:** Association between being various exposures and having a serious injury in the past year.

Exposure	Boys			Girls		
	Percentage of injured with exposure	Percentage of non-injured with exposure	OR (95% CI)	Percentage of injured with exposure	Percentage of non-injured with exposure	OR (95% CI)
Bullied one or more days during the past 30 days	57.1	22.9	4.5 (3.7, 5.7)	53.4	32.3	2.4 (1.8, 3.2)
In a physical fight one or more times during the past 12 months	62.7	42.2	2.3 (1.6, 3.3)	58.0	36.8	2.3 (1.9, 2.9)
Physically attacked one or more times during the past 12 months	51.2	30.7	2.4 (1.8, 3.1)	49.3	30.1	2.3 (1.7, 3.0)
Walked or biked to or from school one or more days in the past seven days	54.8	31.4	2.6 (2.2, 3.2)	32.6	22.1	1.7 (1.1, 2.7)
Missed class or school one or more days without permission in past 30 days	58.3	38.6	2.2 (1.6, 3.0)	47.2	37.7	1.5 (1.1, 2.0)
Washed hands after using the toilet or latrine only sometimes, rarely, or never during the past 30 days	28.5	21.8	1.4 (1.2, 1.7)	13.8	10.8	1.3 (0.8, 2.1)
Ate food from a fast food restaurant three or more days during the past seven days	78.1	63.5	2.1 (1.6, 2.7)	66.9	59.6	1.4 (1.0, 1.9)
Went hungry sometimes, most of the time, or always because there was no enough food at home during the past 30 days	38.7	25.5	1.8 (1.5, 2.3)	28.2	17.6	1.8 (1.3, 2.6)
Students in school were never or rarely helpful or kind during the past 30 days	44.2	31.5	1.7 (1.4, 2.1)	25.2	19.0	1.4 (1.0, 2.1)
Drank carbonated drinks one or more times per day in the past 30 days	65.1	48.4	2.0 (1.6, 2.5)	49.0	42.1	1.3 (0.9, 1.9)
Not physically active for at least 60 minutes on any day in the past week	22.4	28.9	0.7 (0.6, 0.9)	24.0	37.3	0.5 (0.4, 0.8)

OR: odds ratio; CI: confidence interval.

**Table 4:** Most common type of bullying in the past month among students who reported being bullied.

Type of bullying	Total (%)	Injured boys	Non-injured boys	Injured girls	Non-injured girls
Made fun of with sexual jokes, comments, or gestures	51.0	43.1	63.9	43.7	57.3
Made fun of because of race, nationality, or color	15.3	17.9	15.8	15.4	11.6
Hit, kicked, pushed, shoved around, or locked indoors	13.9	22.0	12.2	12.3	10.4
Made fun of because of religion	6.6	5.4	1.0	9.0	5.3
Left out of activities on purpose or completely ignored	4.6	2.2	3.4	7.9	5.6
Made fun of because of how body or face looks	3.7	4.3	1.9	4.9	4.5
Bullied in some other way	5.0	5.1	1.8	6.8	5.4

significant. Among boys, the strongest predictors of having a serious injury in the past year were being bullied, walking or biking to school, missing school without permission, being in a physical fight, and being physically attacked [Table 3]. Among girls, the strongest predictors of having a serious injury in the past year were being in a physical fight, being bullied, and being physically attacked. Other risk factors for serious injuries for both boys and girls were missing school without permission, eating fast food often, and being hungry during the past month.

Of the 1 528 students who answered one or both bullying questions, 38.4% reported being bullied in the past month. Bully victimization rates did not differ by sex or age, but they were significantly different for injured and non-injured students (49.0% vs. 28.4%), even though most of the types of bullying reported were not ones that would directly cause physical injury. The most common form of bullying reported by both boys and girls was being made fun of with sexual jokes, comments, or gestures (51.0%) [Table 4]. Other frequent forms of bully victimization included being made fun of because of race, nationality, or color (15.3%), and being hit, kicked, pushed, shoved around, or locked indoors (13.9%). Injured bullied boys and girls reported less frequent rates of sexual bullying than their non-injured bullied classmates. Bullied boys whose most common form of victimization experienced was being hit, kicked, pushed, shoved around, or locked indoors were significantly more likely than other victims of bullies to report having a serious injury in the past year.

## DISCUSSION

Three key findings stem from this analysis. First, about one-third of school-attending male and female

early adolescents in Oman reported having a serious injury in the past year. Second, although most injuries were not reported to be intentional harm by others, students who reported being physically attacked or in a physical fight were more likely than other students to report having sustained a serious injury. Third, victims of bullies reported more injuries than other students, and the most common form of abuse reported by both bullied male and female students was sexual in nature.

The 34.0% annual incidence rate of serious injuries in the 2010 Oman GSHS is somewhat higher than the annual prevalence rates reported from most other GSHS injury analyses and other studies in LMICs,<sup>6,8,11–13,16,19,20</sup> but it is consistent with the past-year prevalence rates reported in HICs.<sup>7,9,14,15,21</sup> This lower prevalence rate is partly attributable to this paper's use of all three of the injury questions from the Oman database to assign an appropriate injury category and reduce bias toward overestimation of the prevalence rate, rather than relying on just one question about injury frequency. Both the cleaned rate (34%) and the crude rate (41%) for Oman are similar to the injury rates reported from other HICs. The consistency of Oman's injury rates with the rates reported from other HICs suggests that the annual prevalence rate estimated from the Oman GSHS is accurate. Most studies found that adolescent boys sustain more injuries than girls of the same age, as was observed in Oman.<sup>6,10–12,16,22,23</sup>

The finding that broken bones, joint dislocations, and deep cuts are the most common injuries among Omani early adolescents is consistent with that of other GSHS studies, and so is the finding that falls are the most common cause of injuries, with nearly 40% of injured Omani students reporting injuries due to falling or having something fall on them.<sup>6,8,11–13,16</sup> Similar results have been reported

from the HBSC. For example, the Palestine HBSC study found that most injuries occurred at home while biking or running/walking, both of which are activities that can lead to falls.<sup>22</sup> Falls were also the most frequently reported causes of injury in a study of Omani children less than 12 years old, a study of Omani pediatric patients, and a study of students ages 13–20 years in the United Arab Emirates.<sup>21,24,25</sup> Falls among adolescents may be the result of sports participation.<sup>6,26</sup>

In Oman, both being physically attacked and participating in a physical attack were associated with increased risk of injury. This means that both aggressors (those who were in a fight) and victims (those who were attacked) who were involved in interpersonal violence had increased injury rates, even though only about 10% of injuries in the Oman GSHS were attributed to fights and attacks. Fight-related injuries appear to be common among adolescents worldwide. The Palestine HBSC found that nearly 20% of injuries among students in grades six through 12 were attributable to fighting.<sup>22</sup> In seven GSHS-participating African countries, four South American countries, and three Polynesian nations, fighting in the past year was associated with injury.<sup>8,11,12,27</sup> Injuries caused by fighting among adolescents were also reported in a cross-sectional survey of youth from Ireland, Israel, Portugal, Sweden, and the US.<sup>28</sup> Adolescents who are involved in fights may also report more signs of depression, anxiety, loneliness, and social isolation, as found in a study from Egypt, which may relate to risk behaviors that could increase the likelihood of sustaining a serious injury.<sup>29</sup>

Bullying among middle school students is common in both LMICs and HICs.<sup>30–32</sup> In the Oman GSHS, 37% of students were bullied in the past month, and a previous study of eighth grade students in Muscat, Oman's capital city, reported that 77% of students had been bullied during the past year.<sup>33</sup> The rates of victimization by a bully reported in other countries from North Africa and the Middle East range from 30% to 60%.<sup>34,35</sup> Bullying was also associated with injury in other GSHS-participating countries.<sup>8,11,12,27</sup>

In general, adolescent boys around the world report being physically bullied, while adolescent girls report being socially excluded by their peers or teased about their appearance. For example, an examination of bullying in 15 GSHS-participating

countries in Latin America and the Caribbean found that, after "other," the most frequent type of bullying reported by boys was being hit, pushed, shoved around, or locked indoors, and the most common type reported by girls was being made fun of because of how their face or body looked.<sup>36</sup> Sexual bullying—being made fun of with sexual jokes, comments, or gestures—was rare in that analysis.<sup>36</sup> It was therefore unexpected that sexual bullying was the most common form of bullying reported by both boys and girls in the Oman GSHS, especially since Oman is considered to have conservative social values. This finding requires verification by future surveys of Omani adolescents, which should aim to clarify what types of sexual bullying are being experienced. A study in the US has noted that "making sexual comments, jokes, gestures, or looks"—a close match to the GSHS survey item—is one of many types of sexual violence that schoolchildren can engage in.<sup>37</sup> Other forms of sexual violence at schools can include being shown or given sexual pictures or messages, having sexual rumors spread about a student, having clothes pulled off or down, being touched or grabbed in a sexual way, being forced to engage in sexual behaviors such as kissing or touching, and other forms of inappropriate activities.<sup>37</sup> Discussing sexual violence in Oman may be difficult since it is a sensitive topic, but it is necessary to prevent the long lasting emotional consequences of such attacks.<sup>38</sup> Once the nature of the bullying in Oman is better understood, appropriate school health interventions to prevent this type of inappropriate behavior can be implemented.

There are several limitations that require the results of the Oman GSHS to be interpreted with caution. One is that the GSHS is a self-report cross-sectional survey and student responses were not validated with observational data or parental, school, or medical records. Another is that the GSHS's closed-ended questions do not allow students to describe the types and causes of injuries that are not included in the list of pre-coded responses. If students were allowed to list their "other" types of injuries, students reporting non-severe injuries could be reclassified as having not sustained a serious injury in the past year, which would improve the accuracy of that rate. Having additional information on the various types, causes, and severity of injuries would also be helpful for further exploring adolescent injuries and developing preventive interventions. The GSHS also

included only children currently attending school. The most seriously injured students might be absent from school and therefore not able to participate in a survey of nonfatal injuries. The strengths of the GSHS and the HBSC include the use of common methods and validated questionnaire items to allow cross-country comparisons of results.

## CONCLUSIONS

This study highlights the high prevalence of injuries among early adolescents in Oman. The associations between bullying, injuries, and violence points to healthier peer relationships-with fewer attacks, less fighting, and reduced rates of bullying, especially sexual bullying-as a possible mechanism for reducing the risk behaviors that can lead to injuries in this age group. Promoting the cognitive, emotional, and behavioral development of children and adolescents requires the combined expertise of interprofessional teams.<sup>39</sup> Clinicians, counselors, other healthcare professionals, schoolteachers and school administrators, parents, religious and cultural leaders, and other adults in the community can help promote healthy relationships among middle school students and can help reduce youth injuries by enforcing a zero-tolerance approach to fighting and bullying among students.

### Disclosure

The authors declared no conflicts of interest. No funding was received for this study.

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