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Epidemiology of injuries in school: Analysis of 3285 medical entries in a suburban school

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Abstract
Background: Injuries in school are a common phenomenon. However, we do not yet know the incidence of these injuries. We, therefore, examined the medical record of a busy suburban school to understand the pattern of injuries and any other medical conditions.
Methods: We examined all medical entries including injuries and any other medical conditions seeking medical attention between June 2012 and October 2012(both months inclusive) in a suburban school.
Results: 56.01% of all entries **(**1840 entries) were injuries alone. Out of all injuries, 94.45% injuries were outdoor injuries (1738 entries). Considering open and closed nature of injuries, open injuries were found to be contributing 76.57% to all injuries (1409 entries).
Conclusions: Our study indicates that almost one in ten children attend medical room with various medical conditions, more than half of which are due to injuries. This is an important observation and can help in planning prevention of unintentional injuries in a school atmosphere.

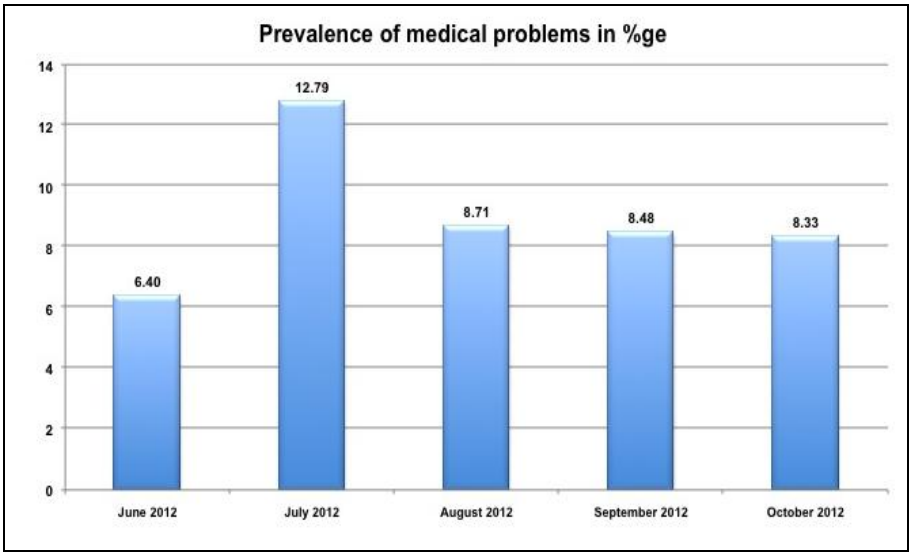
Keywords: Injuries in school; outdoor injuries; injuries in children; unintentional injuries

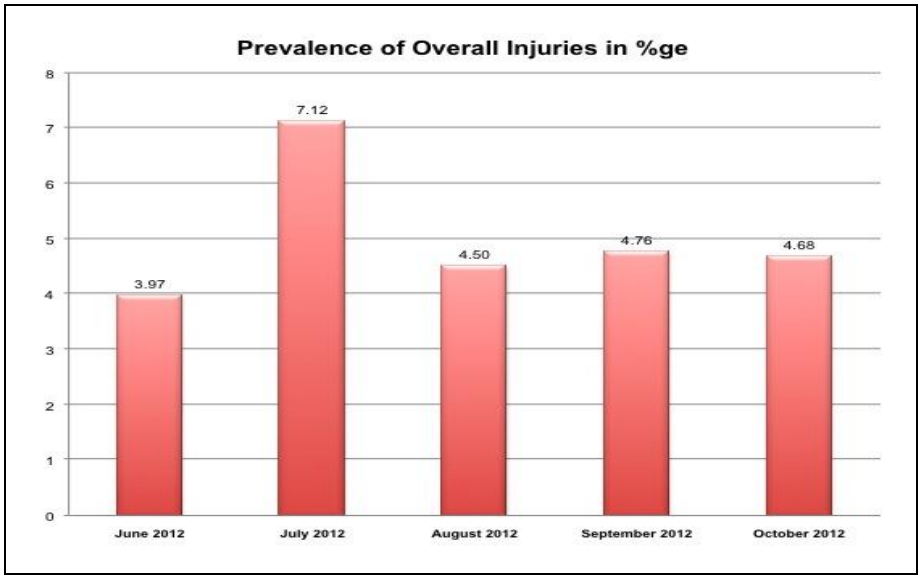
Introduction
Children spend most of the day in school. It is also well known that most children seek medical attention in the school for various ailments. Until now, we do not have exact idea of the number and incidence of medical reporting in school. Injuries are reported as the most common cause of mortality in children and account for considerable childhood morbidity [1]. There are many publications representing results on accidents occurring in childhood [2-5] but there are hardly any studies showing the analysis of both major and minor medical problems and injuries encountered in a day spent in the school by an Indian school going child. So we studied the pattern of medical problems as well as injuries in school children, in an Indian educational institute, with the aim of estimating the incidence and pattern of injury in school children.

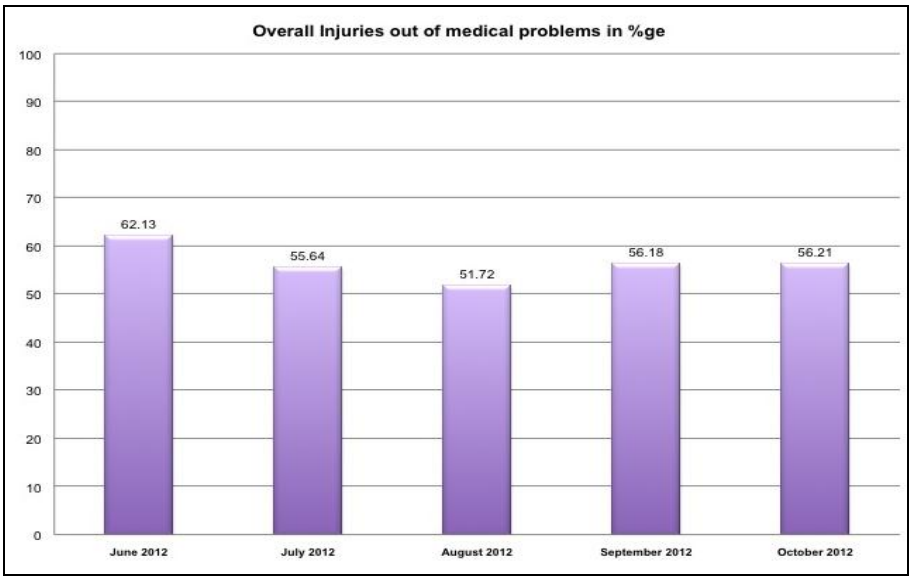
Materials and methods
We looked at the medical entries of a busy suburban school, from June 2012 to October 2012. These entries were examined for common day to day ailments such as abdominal pain, headache and most importantly injuries. All entries were examined for various medical complaints. Overall 3285 entries were studied.

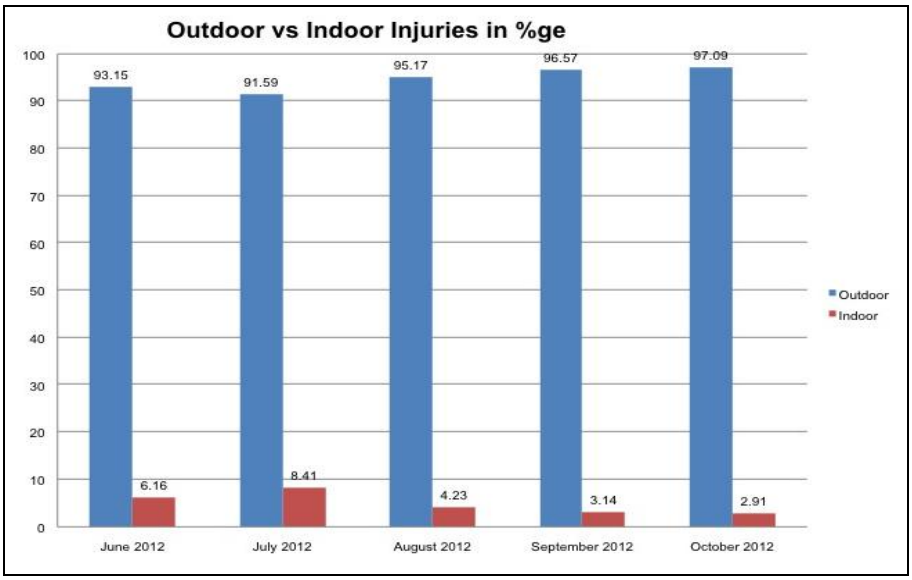
Results
Data was entered into SPSS for analysis. A total population of 7349 pupils studying in one educational institute was studied. Out of 7349 students, per month mean 8.94% (range 6.40% to 12.79%) students visited school medical facilities for minor as well as major medical problems.
Fig.1 shows the distribution of the medical problems for which students visited medical facility. In our study, injuries had its position on top in the list of medical complication by contributing 56.01% of the medical problems followed by headache with 8.79% of prevalence.
Table 1 shows the distribution of medical problems.
Table 2 shows the month wise distribution and analysis of the number of visits due to injury.
Out of 3285 medical visits spread over 5 months, 1840 were total cases of injury that represents mean 56.01% of the total medical visits.

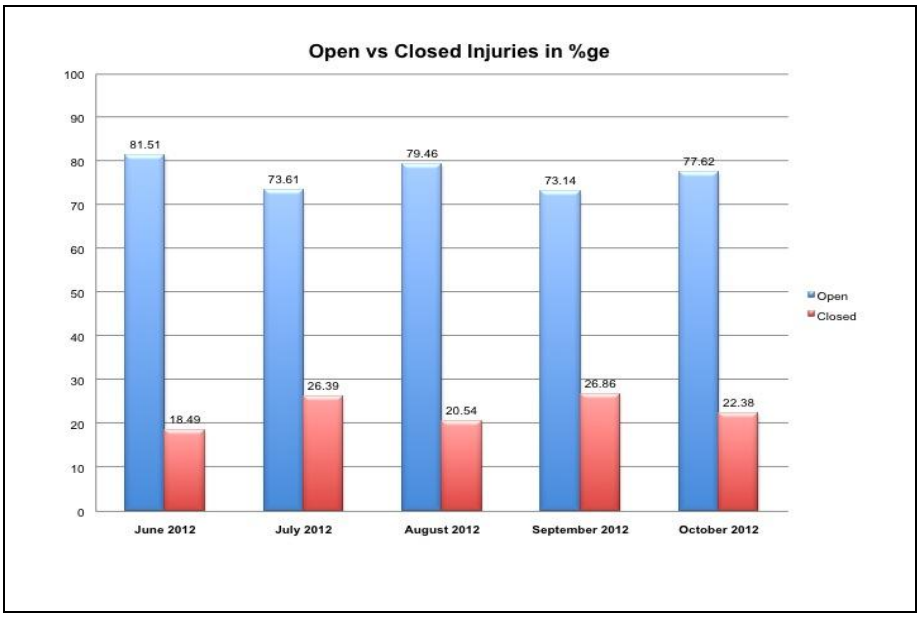
Overall, 5.01% of students were injured per month in our study. Fig. 2 shows the prevalence of injury in population. Fig. 3 shows prevalence of injury out of total medical visits. Considering the sex wise distribution in five months, 24% of the total female population and 26% of the male population had visits for the injury. Table 3 shows sex wise distribution of injuries. We also categorized injury in two groups; indoor injuries and outdoor injuries. Out of all injuries, 94.45% injuries were outdoor injuries and rests of the 5.55% injuries were indoor injuries. Table 4 and fig. 4 shows statistics of Outdoor and Indoor Injuries. In our study we also classified them as open injuries and closed injuries. Open injuries were found to be contributing 76.57% to all injuries. Table 5 and fig. 5 shows statistics of open and closed injuries.











4. Discussion

The etiology of injury involves a complex interplay between human and environmental factors. School children move from a protected environment at home to relatively independent environment at the school. The nature of injury varies according to demographic factors including age, sex, residence and socioeconomic status, all of which are difficult to modify. It is very difficult to intervene into or modify the susceptible and injury prone environment at school until we know the pattern of these injuries.

We studied injuries under two categories; indoor injuries and outdoor injuries. Indoor injuries included injury due to bench, pen, pencil, water bottle, compass etc. These injuries occurred inside the classroom during teaching hours or interval between two classes. Outdoor injuries mostly occurred during the playtime or lunch hour. Modes of outdoor injuries were fall while running, hit or bite by other children, hit by ball or stone etc.

Our study showed that outdoor injuries were much more common than indoor injuries. So to prevent or minimize the morbidity due to injury, schools should take more precautions at the outdoor premises.

We have also classified injuries in two groups; open injuries and closed injuries. Open injuries were those which had breach in the continuity of skin e.g. abrasion, laceration and these injuries required dressing. Closed injuries did not have any external wound e.g. swelling, sprain. They were mainly treated by ice pack application and analgesics. In these two groups, open injuries were three times more common than closed injuries. So the school medical facility should be ready to deal with these open wounds with appropriate and adequate stock of dressing material.

There were 15 cases where we found that the injury was due to careless handling of the neck hanging identity card that led to noticeable abrasions. Surprisingly all the children were under 10 years of age. Because of the less maturity and lack of precise coordination, these children are more susceptible to this kind of injury. Many such identity card injuries go unnoticed due to their minor nature. So we recommend that in children less than 10 years, hard and sharp identity cards should not be given. Rather, a protective soft rubber cover should be used on these cards.

Conclusion

Our study indicates that almost one in ten children attend medical room with various medical conditions; more than half of which are due to injuries. This is an important observation and can help in planning prevention of avoidable injuries in a school atmosphere.

Table 1: Overall medical problems

Medical problem	No. of visits in all five months	Prevalence in %
Injury	1840	56.01
Headache	289	8.79
Fever	283	8.61
Abdominal pain	177	5.38
Body ache	110	3.34
vomiting	81	2.46
Cough and cold	80	2.43
Boils	45	1.36
Eye problem	25	0.76
Ear problems	17	0.51
miscellaneous	310	9.64

Table 2: Month wise visits due to injury

Month	Visits for Medical Problems	Injuries	Prevalence of medical problems (%)	Prevalence of Injuries	Overall Injuries out of medical problems in (%)
June	470	292	6.40	3.97	62.13
July	940	523	12.79	7.12	55.64
August	640	331	8.71	4.50	51.72
September	623	350	8.48	4.76	56.18
October	612	344	8.33	4.68	56.21

Table 3: Sex wise distribution of injuries

	Male	Female	Total
Injury	1078	762	1840
total	4471	2878	7349
% of the students getting injury	24.11	26.47	25.03

Table 4: Outdoor and Indoor Injuriess

Month	Overall Injuries	Outdoor	% Outdoor	Indoor	% Indoor
June 2012	292	272	93.15	18	6.16
July 2012	523	479	91.59	44	8.41
August 2012	331	315	95.17	14	4.23
September 2012	350	338	96.57	11	3.14
October 2012	344	334	97.09	10	2.91

Table 5: Open and Closed Injuries

Month	Overall Injuries	Open	% Open	Closed	% Closed
June 2012	292	238	81.51	54	18.49
July 2012	523	385	73.61	138	26.39
August 2012	331	263	79.46	68	20.54
September 2012	350	256	73.14	94	26.86
October 2012	344	267	77.61	77	22.69

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