The Status of School Events in Middle School Students in Isfahan Province

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ABSTRACT

Background: Adolescents are being threatened by several accidents because of entering the new world of adulthood, separation from families, a greater presence in community individually, the lack of knowledge of rules and risk-taking spirit of adolescents, and events. The contribution of these damages and their related costs are higher in developing and low-income countries. The current study was conducted for proper planning focused on reducing accidents that have the highest incidence, evaluating school events, determining the place and time that most accidents happened to students and determining the body part injured.

Methods: A cross-sectional study using a multistage cluster sampling was conducted on 6933 students 11–14 years old (middle school) in 2009–2010 in Isfahan Province. The data were collected through observation and a researcher-made questionnaire and then entered into the EPi6 software, and analyzed by the SPSS 11.5 software and the statistical test of Chi-square.

Results: The findings showed that 49.9% of students were girls (n = 3462) and 50.1% (n = 3471) were boys, 84.5% of students (n = 5860) were living in urban areas and 15.5% of students (n = 1073) were living in rural areas. Frequency distribution of incidents was 53.9% (3739 cases) at school and 10.6% (732 cases) on the commuting route. The most injured body part was hand with 1018 cases (18.5%) and foot with 1267 cases (23.1%), and mostly they were injured in boys.

Conclusions: The findings showed that a high percentage of students were injured at school, where the first step to prevent the incidence of such preventable incidents at school is to secure workshop environments and school yards.

Keywords: Incidents, Isfahan, middle school, students, traffic accidents

INTRODUCTION

Population growth and increased use of cars in everyday life make each day prone to new accidents and events in everyone’s life. Adolescents are threatened by several accidents when they...
enter the new world of adulthood, separate from families, are individually present in the community more often, lack the knowledge of rules and have the risk-taking spirit. The share of such damages and their related costs is higher in developing, and low-income countries in that 8.5 million annual deaths worldwide result from accidental damages. Every day, 16,000 people die because of a variety of incidents. Accidents constitute 12% of the global burden of diseases and are the third major cause of death and the primary cause of death in 1 to 40-year-old people. Schools have a major contribution in incidents because their construction site is not safe in 60.8% of cases, and only 56.9% have safe stairs. The most common incidents for students by location can be classified into three categories: (a) Traffic accidents, (b) home accidents, and (c) environment accidents. School is one of the environments where the child spends the most time with groups of peers as well as younger and older children. School can pave the grounds for debilitating accidents and even lead to death of children due to certain circumstances such as the accumulation of a large number of children, their developmental profile (growth induced mood and physiologic changes), the difficulty in monitoring them, particular environmental conditions such as stairs, hallways, school yards, playground, and probably gym etc., Events are generally one of the problems of childhood that are increasingly growing.

Accidents often occur and sometimes victims are school students. School-aged children and adolescents may be more vulnerable than others to life events due to their developmental stage, so they need special attention. It has been shown that a lot of damage occurs to students during school hours. Children and adolescents are the most vulnerable group in this regard, and their disability creates a profound stagnation in social activities. The range of damage is also widespread including physical, psychological, and economic effects that progress in community like a huge wave.

Obviously, the prevention of accidents is not possible without organizing and planning fundamental measures, therefore, one of the most important steps in planning to prevent accidents is to conduct studies on accidents and incidents. Preventing from children's injuries has a major role in keeping them safe, and safety cannot be achieved unless causes of damage are known and then necessary preventive measures are considered. Given no extensive study has been conducted to determine the prevalence of school accidents at this education and age level in recent years, this study was conducted for the proper and focused planning on school accidents and reducing the most prevalent ones and those prioritized by Education Office.

METHODS

A cross-sectional study was conducted on 7000 middle school students 11–14 years old resident in Isfahan Province by a multistage cluster sampling. Using the sample size formula with \( z = 0.95, P = 0.05, d = 1.46 \), and the data obtained from the accident registration office in provincial health center and the incidence of accidents in this age group in 2007, at first the total number of middle school students in the province were determined (188,562 students), and then the sample size \( (n = 7000) \) and students in this educational level in each city were identified. The names of students were determined for questioning by identifying the sample size in each city, the number of urban and rural samples, the list of middle schools separately for each city, determining sample size in every school, and ultimately using students' list and random number table. For data analysis, similar regions in terms of cultural, social, and economic conditions that had a small number of samples were merged, and the results were generalized to both cities. This study was conducted in 2009–2010 in Isfahan Province except cities of Kashan and Aran-Bidgol. The questionnaire face and content validity was determined by 7 experts. To determine questionnaire reliability, two schools were selected at random, and 30 students were questioned, so Cronbach's alpha was found as 75% and its reliability was confirmed. Incomplete questionnaires (i.e. questionnaires with inappropriate answers, incorrect response, irrelevant answers and out of discussion or questionnaire without answer) were excluded from the analysis. If a questionnaire was excluded, another matching student with the same gender, age, and grade of the same school was replaced. The questionnaire included questions on age, gender, education and occupation of parents, city name, the middle...
school name, accident type, accident time, the location of accident, and the injured body part. By choosing experienced questioners, training them, and giving them a 5-item guideline, we controlled the interview confounding factor and uniformed data collection. During the questioning, executives monitored the way of questioning. Coordinators in each city entered the data into Epi6 software (centre of disease control and prevention) after collecting and encoding the data. SPSS software (Version 11.5, SPSS Inc., Chicago, IL) was used to analyze the data with descriptive statistics (including the absolute frequency, percentage, frequency distribution tables and figures) and analytic statistics (Chi-square).

RESULTS
The total sample size was 7000, which came to 6933 given that incomplete questionnaires were excluded. Table 1 showed participants’ characteristics according to region, gender, age, parents’ education and occupation.

Data in Table 2 indicate that there is no statistically significant relationship between residential area and school accidents ($P = 0.168$), but a significant relationship was observed between the school accident and gender ($P < 0.001$).

Of 6933 subjects questioned, 3739 students (53.9%) stated that they had an accident within the school, and 732 students (10.6%) had an accident on the commuting route.

According to Figure 1, workshop had the highest rate of accidents at school where students’ activity is supervised by a trainer or teacher.

Figure 2 shows that the most injured body part subjects’ feet and hands.

CONCLUSIONS
Results showed that a high percentage of students were injured in school accidents and a few on the commuting route. Most accidents are preventable by observing safety measures at schools. In 1981, the incidence of school related injuries was reported 10–20%. Studies show that 20–30% of injuries in children occur at school and its surroundings.[4] It is reported that most traumas in children younger than 15 years occur at home and school.[9] School accidents are higher among boys. In other words, gender has an effect

| Table 1: Frequency distribution of middle school students questioned according to region, gender, age, parents’ education and occupation |
|---------------------------------------------------------------|
| **Region** | **Number** | **Percentage** |
| Urban | 5860 | 84.5 |
| Rural | 1073 | 15.5 |
| **Gender** | | |
| Girl | 3462 | 49.9 |
| Boy | 3471 | 50.1 |
| **Age** | | |
| Younger than 13 years | 2286 | 33 |
| 13 years | 2360 | 34.1 |
| 14 years and older | 2268 | 32.8 |

| Table 2: Frequency distribution of school accidents based on gender and urban-rural region in middle school |
|---------------------------------------------------------------|
| **Region** | **Gender** | **Number** | **Percentage** | **$\chi^2$** | **$P$** |
| City | Girl | 1534 | 48.2 | 1.897 | 0.168 |
| | Boy | 1647 | 51.8 | | |
| Total | | 3181 | 54.3 | | |
| Village | Girl | 239 | 42.8 | 20.551 | 0.001 |
| | Boy | 319 | 57.2 | | |
| Total | | 558 | 52.0 | | |
| Total | Girl | 1773 | 51.2 | 0.168 | 0.168 |
| | Boy | 1966 | 56.6 | | |
| Total | | 3739 | 53.9 | | |
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on school accidents, and school accidents occur more among boys than among girls. Of under-15 children with trauma referred to Alzahra Hospital, 66.7% were boys, and 33.3% were girls. The most common type of accident (32%) was falling. In this research, the percentage of boys who had an accident was more than girls. The main reasons for nonfatal injuries were falling, animal bite, accidents, falling objects, and burning. Most children experienced only one injury. Accidents are a major cause of mortality in children. It was shown that falling (64.2%) was the most common cause of dental trauma in Nigerian children. Children younger than 15 years are more vulnerable to damages due to falling. Falling of this group of children (students, workers, farmers, and salespeople) is more than other nonworking children. In the present research, the percentage of height and stair accidents, which might be similar to falling accidents was rarely seen. In a research conducted on incident patterns of children younger than 15 years who had accidents in Mazandaran Province in 1999–2000, it was revealed that falling (30.1%) and road accidents (26.6%) were the most common accidents. However, in this study, 1.7% of students stated that they had falling accident at school.

Regarding incidence rate of school accidents in elementary schools in Kerman Province, the following results were obtained: The causes of accidents: Falling 34.3%, running 49.8%, violent movements 30.3%, physical fight 28%, using cold weapon 1.9% and sports field accidents 20.7%. The injured body parts were hands 43.9%, head 28.5%, feet 15.3%. Most (60%) children had multiple injuries, 24% had contusion, and 10.7% had fractures. Most accidents (81%) were remedied at school, 12.65% were treated as outpatient, and 5.4% needed hospitalization. The hospital stay duration was 76 days and absenteeism after the accident was 134 days. Accidents mentally engage the family and school, cause physical suffering for children and can have a negative effect on their educational progress due to absenteeism. Furthermore, other studies confirm our findings about the injured body part especially hands and arms.

According to a study conducted at the Shiraz University of Medical Sciences on the extent and causes of accidents in middle school students, accidents in the age range of 5–17 years were the leading cause of death. Based on this study, the incidence rate of accidents was 1.2% totally, 0.6% in girls and 1.49% in boys. The highest rate of injury was related to hands and arms among other body parts. These data indicated that the incidence of accidents was more among students of the first grade in middle school.

Children have so much energy; therefore, they are constantly engaged in physical activity. When the child reaches school age, injuries due to school accidents are observed as falling, injuries due to exercise or physical activity and physical fights.

To reduce deaths from accidents in students, especially drowning and falling, efficient safety, and preventive measures should be developed in Education Office to avoid waste of money. Traumatic dental injuries are very common in school students, and falling has been its major cause. Children are always at home, at school and in the community, and these places should have high health and safety standards. The results of this research showed that many schools have a small area per capita. Only 53.2% of schools had the desired standards with respect to the number of students. It has been observed that a proper sleep at night has a key role in resistance...
to diseases, injury prevention, and mood stability. A significant relationship was observed between the incidence of injuries and disorders and length of time in school children.\cite{22}

The incidence of nontraffic accidents was reported for 91/100000 for boys and 43/100000 for girls, and 65% were due to falling, 17% due to burning, 3% due to animal-related injuries, and 1% due to other cases.\cite{23} Falling (30.1%) and accidents (26.6%) are the most common accidents. Meanwhile in this study, 1.7% of students stated that they had fallen in school. Hands and arms have the highest rate of injury among other body parts. The data of this study indicate that the incidence of accidents was more among students of the first grade in middle school.\cite{13,15}

In this study, the incidence rate of accidents was 1.2% in total, 0.6% in girls and 1.49% in boys. Hands and arms had the highest rate of injury among other body parts.

**CONCLUSIONS**

The incidence rate of accidents in middle schools of Shiraz compared to the research conducted in Canada is significantly lower. As the incidence rate of accidents was higher in students of the first grade in middle school, special attention should be given to younger students, and they should be instructed toward healthy and low-risk activities. Furthermore, development of safe educational environment and a proper behavioral culture in students for break hours are very effective in reducing accidents. Hence, more parental or caregivers’ care and monitoring play an important role in reducing injury in the morning. Teachers and schools authorities can also prevent such injuries by training and giving necessary advice and attention to children’s behavior.\cite{24}

**REFERENCES**

1. Ali RY, Shahin T. Prevention of Events in Children. Tehran: Ministry of Health, Treatment and Medical Education, Diseases Management Center; 2003.
2. Margie P, Richard S, David S, Dinesh M, Adnan AH, Eva J, et al. World Report on Road Traffic Injury Prevention. Translated by Naseh MH. Tehran: WHO; 2006.
3. Maral G, Abed N, Abdelhadi K, Mohammad D, Azizeh C, Mahin A. Selected Proceedings of the Second Conference on Safe Community of Tehran. Evaluation of Schools Safe Status of Kalaleh city in 2009.
4. Sharareh K, Farideh Y. Designing form of recording events for school students. Sci J Forensic Med 2010;16:79-87.
5. Sepideh O. Unfortunate events at schools: Outcomes and Dos. J Payesh 2012;11:777-83.
6. Limbos MA, Peek-Asa C. Comparing unintentional and intentional injuries in a school setting. J Sch Health 2003;73:101-6.
7. World Health Organization. Safe Community Foundation of Canada: Safe Community (Guidebook), Translated by Moghisi A. Tehran: Ministry of Health, Treatment and Medical Education, Diseases Control Center, Department of Accidents and Events, First Publication; 2003.
8. Brussoni M, Olsen LL, Pike I, Sleet DA. Risky play and children’s safety: Balancing priorities for optimal child development. Int J Environ Res Public Health 2012;9:3134-48.
9. Memarzadeh M, Hosseinpour M, Sanjari N, Karimi Z. Epidemiology of trauma in children referred to Isfahan Alzahra Hospital during 2004-2007. Feiz Sci Res J 2010;14:488-93.
10. Hu M, Hu GQ, Sun ZQ, He X. Epidemiological survey of the prevalence of non-fatality injury among children aged 5-14 years in China. Biomed Environ Sci 2012;25:407-12.
11. Shilon Y, Pollak Y, Aran A, Shaked S, Gross-Tsur V. Accidental injuries are more common in children with attention deficit hyperactivity disorder compared with their non-affected siblings. Child Care Health Dev 2012;38:366-70.
12. Taiwo OO, Jalo HP. Dental injuries in 12-year old Nigerian students. Dent Traumatol 2011;27:230-4.
13. Bachani AM, Ghaffar A, Hyder AA. Burden of fall injuries in Pakistan – Analysis of the National Injury Survey of Pakistan. East Mediterr Health J 2011;17:375-81.
14. Zahra E, Nazanin V. Examining patterns of Accidents in crash children less than 15 years in Mazandaran Province in years 1999-2000. J Mazandaran Univ Med Sci 2000;10:1-7.
15. Eshagh D, Abbas B, Naser H. The appearance of school events in primary schools of Kerman. J Kerman Univ Med Sci 2008;16:93.
16. Farid A, Hamidreza S, Farid A, Tabatabaei, Hamidreza S. Evaluation of the incidence and causes of events in middle-school students of Shiraz. J Kerman Univ Med Sci 2008;16:56-60.
17. Karande N, Shah P, Bhatia M, Lakade L, Bijle MN, Arora N, et al. Assessment of awareness amongst school teachers regarding prevention and emergency management of dentoalveolar traumatic damages at school children in...
Pune City, before and 3 months after dental educational program. J Contemp Dent Pract 2012;13:873-7.

18. Shin SM, Lee HW. Accidental mortality and compensation payment in school activities among elementary, middle and high school students in Seoul over twenty years (1988-2007). J Korean Acad Nurs 2012;42:248-57.

19. Kumar A, Bansal V, Veeresh KL, Sogi GM. Prevalence of traumatic dental injuries among 12- to 15-year-old schoolchildren in Ambala district, Haryana, India. Oral Health Prev Dent 2011;9:301-5.

20. Rajab LD, Baqain ZH, Ghazaleh SB, Sonbol HN, Hamdan MA. Traumatic dental injuries among 12-year-old schoolchildren in Jordan: Prevalence, risk factors and treatment need. Oral Health Prev Dent 2013;11:105-12.

21. Kermani M, Farzadkia M, Tysefi Z, Ghandali R. Investigating the environmental health and safety status among primary schools. J Mazand Univ Med Sci 2012;22:85-9.

22. Rafii F, Oskouie F, Shoghi M. The Association between Sleep and Injury among School-Aged Children in Iran. Sleep Disord 2013;2013:891090.

23. Grivna M, Barss P, Stanculescu C, Eid HO, Abu-Zidan FM. Home and Other Nontraffic Injuries Among Children and Youth in a High-Income Middle Eastern Country: A Trauma Registry Study. Asia Pac J Public Health 2011. {Epub ahead of print}:DOI:10.10539511430252.

24. Alireza D, Farzan K, Hassan R, Leyla R, Hesam S, Kourosh G. Epidemiology of blunt ocular trauma to the eye in patients with less than 16 years referred to Isfahan Feiz Hospital in 2009. Bina J Ophthalmol 2011;17:54-9.

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