

Characteristics of Accidental Injuries and Risk of Severity Among Adolescents in Dubai

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Abstract

Background: Child injuries are an important public health and development issue. According to a recent report by WHO and UNICEF, more than 2000 child die each day as a result of unintentional or accidental injuries. Death is the most notable measure of injury but it's not the only one or the most common one. Objectives: To study the case characteristics, environmental features and risk of severity of unintentional injuries among student at private schools in Dubai. Methodology: Cross-sectional study was conducted on students of grade 7 – 12 both males and females in Dubai's private schools. Sample size was calculated using computer program EPI-Info version 6.04. The minimal sample size is 1000 student. Multistage stratified random sample with proportional allocation was carried out. The data was collected by a self-administered questionnaire composed of 32 items. Results: the total incidence rate among all school students were 297.7/1000. 88.9% of the injuries were mild, 9.0% were moderate and 2.1% were severe injuries. 851 cases occurred later in day time, 89% of them were mild, 9% moderate and only 2% were severe. Most of the injuries (686) occurred in the first semester. Most of the injuries (744) were caused by the injured student himself. Almost 80% of injuries occurred in fine weather. Almost half of all injuries occurred in the playground. School safety was the most frequent cause (364) of injury occurrence in the study sample. Falls accounted for almost half of the injuries Conclusion: The incidence of unintentional injuries is high, but severe cases are minority. Factors that may contribute to severity are the student himself, the playground and falls. Health education and school environment need to be given more importance in the planning for prevention programs.

Keywords

Risk of Severity, Accidental Injuries, Schools, Dubai

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1. Introduction

WHO stated that injuries are a leading cause of the global burden of death and disability for all age groups below 60.¹ Injuries affect health and welfare of all age groups regardless of country of origin, economic status through premature death, disability, medical costs and loss of productivity.² Child injuries are an important public health and development issue.³ According to a recent report by WHO

and UNICEF, more than 2000 child die each day as a result of unintentional or accidental injuries.³ Death is the most notable measure of injury but it's not the only one or the most common one.⁴ Injuries were categorized into fatal and nonfatal ones. The fatal injuries were further categorized into unintentional and intentional. The unintentional injuries included: road traffic collisions, drowning, burns (fire or

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scalds), falls or poisoning asphyxiation, choking, animal or snakebites, hypothermia and hyperthermia.⁴ Moreover as per this combined report of WHO and UNICEF, the unintentional injuries account for 83% of all child injury deaths. Africa has the highest rate of unintentional childhood injuries death; it was found that Africa is 10 times higher than high-income countries in Europe and Western Pacific countries such as Netherlands, Sweden and UK.⁴

In the Eastern Mediterranean Region, the burden of unintentional child injuries is one of the highest in the world, especially in low- and middle-income countries. The Eastern Mediterranean Region endures about 12% of all unintentional injury deaths of the world in those fewer than 20 years of age, again differentially affecting the disadvantaged sections of the society.⁴

Children's physical and cognitive abilities, dependence degree, risk behaviours are all subjected to change eventually as they grow and develop.⁵ As they grow further their curiosity and wish for adventures grow and don't match their capacity to perceive danger.⁶ Along with this, their short stature increases their risk in road environment, as they are less visible than adults if hit by any vehicle and more susceptible than adults to have a head or neck injuries.⁷ There are some other physical characteristics that make children vulnerable to injuries. For example, their skin that may be burnt at lower temperatures than adults, as a small amount of poison can be toxic. Their smaller size that creates as a risk of body parts entrapment most dangerously for their head.

Several studies of road traffic injuries have showed lack of knowledge, skills and levels of concentration of children that are required to manage the road environment. Also their physical and cognitive abilities do not match each other.⁸ Boys tend to have more frequent and severe injuries than girls.⁹ this fact has been proved in many developed countries,¹⁰ but this pattern is less uniform in low and middle-income countries and the overall gender difference is clear. Many theories have been proposed for the injury rates difference between boys and girls.¹¹ Some of these state that boys engage themselves in more risky behaviour than girls, that they have more impulsively and they are less likely to be retrained by their parents than girls.¹²

Most of the childhood injuries rest in low and middle-income countries, and are disproportionately distributed.¹³ A broad range of socioeconomic factors is associated with injury risk.¹⁴ They range from economic factors such as family income; to social factors such as maternal education; to factors related to family structure such as single parenting, maternal age, numbers occupying the household and number of children; to factors related to accommodation e.g. type of tenancy, type of housing, and level of crowding. The risk of

injury is affected by these socioeconomic factors in several ways.¹⁴ In poor household, parents may not be able to properly care for and supervise their children. Children living in poverty may be exposed to hazardous environments such as fast moving traffic, lack of safe facilities for playing, cramped living conditions with lack of proper kitchens, unprotected windows and house roofs and safe stairs.

Poor access to good quality medical services is an important factor in variation of mortality rates. For instance, a Nigerian study of 84 children showed that 27% of these admitted children for burn died as a result of their injury.¹⁵ this contrasts with a study held in Kuwait on 388 children from which 1% just died of the injury.¹⁶

One set of behavioral factors that play a prominent role in child injury risk is the influence of parents. Among young children, a constellation of traits encompassing parental supervision and monitoring, parental mental health, and parental engagement in the child's life appears to be among the strongest behavioral correlates to pediatric injury outcomes.¹⁷ During early child development, parents have the responsibility to supervise young children in potentially injurious situations because children do not yet have the cognitive, perceptual, motor, or impulse control capacities to engage safely in dangerous situations. Parents also serve as role models for young children and spend considerable time training children about safety-related rules and how to make safe decisions in potentially dangerous environments. As children develop, parents and other adults play a diminishing role in protecting children from injury. By school age; children make decisions about how to behave independently, and therefore accept increasing responsibility to protect their own safety. However, parents continue to play some role in pediatric injury prevention after children enter school.¹⁸

2. Objectives

To study the case characteristics, environmental features and risk of severity of unintentional injuries among student at private schools in Dubai.

3. Methodology

Cross sectional study design was held on students of grade 7 – 12 both males and females in Dubai's private schools. Incidence rate was calculated as a total number of cases in dubai divided by the target population. Cases sample size was calculated using computer program EPI-Info version 6.04. The minimal sample size would be 1000 student. Multistage stratified random sample with proportional allocation was carried out. The stratification was based upon regions (Deira and Bur Dubai), and gender (male and female).

The data was collected from students by a pilot study tested self-administered questionnaire composed of 32 items. The English questionnaire was reviewed by community medicine consultants and translated into Arabic language. The questionnaire was adopted and modified from a validated and reliable questionnaire from a study held in China.¹⁹ It was reliable and validated as Cronbach's α coefficient of reliability is 0.78 in this study. It aims at gathering information about students who have been involved in the event of unintentional injuries at school.

4. Results

Table 1 shows incidence rate of unintentional injuries among Dubai private schools students. It explains that the highest incidence rate among private school student was among the age group of 14-15 years old which was 416.9/1000 while the total incidence rate among all school students were 297.7/1000

Table 1. Incidence rate of unintentional school injuries among Dubai Private Schools students according to age and sex, 2012.

Variable	Injuries	population	Incidence rate/1000	
Age	12-13	1501	6000	250.1
	14-15	1370	3286	416.9
	16-17	1100	4050	271.6
Total	3,971	13336	297.7	
Sex	Male	3101	8336	372.0
	Female	870	5000	174.0
Total	3,971	13336	297.7	

Table (2) shows the incidence rate of injuries according to their severity in Dubai private schools in 2012. It can be seen that about 88.9% of the injuries were mild, followed by moderate injuries (9.0%) and least of those was the severe injuries for about 2.1%.

Table 2. Frequency distribution of injuries among study population according to their severity in Dubai private schools, 2012.

Injury severity		Frequency	Percent
Injury severity	Mild	889	88.9%
	Moderate	90	9.0%
	Severe	21	2.1%
Total		1000	100.0%

Table (3) shows the association between injury severity and the time of injury occurrence, in Dubai private schools 2012. It can be noticed that most of the injuries (851) occurred later in day time and 89% of them were mild ones and 9% moderate and only 2% were severe. Among the injuries occurring early morning, most (88.6%) were mild and only 2.7% severe. This relationship was not statistically significant $p = .860$

Table 3. Association between time of day when injured and injury severity in Dubai private schools, 2012

Time of injury		Mild	Moderate	Severe	Total
Time of injury	Early morning	132 (88.6%)	13 (8.7%)	4 (2.7%)	149 (100%)
	Later in day	757 (89.0%)	77 (9.0%)	17 (2.0%)	851 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square		.302	p-value	.860	

Table (4) shows the association between injury severity and semester of injury occurrence, in Dubai private schools 2012. It demonstrates that most of the injuries (686) occurred in the first semester and 89.1% of them were mild and only 2% severe. Follows the 3rd semester where 182 injuries occurred and 92.3% of them were mild and only 1.1% severe. This association was not statistically significant as $p = .149$

Table 4. Association between semester when student injured and injury severity in Dubai private schools, 2012.

Semester		Mild	Moderate	Severe	Total
Semester	1 st	611 (89.1%)	61 (8.9%)	14 (2.0%)	686 (100%)
	2 nd	110 (83.3%)	17 (12.9%)	5 (3.8%)	132 (100%)
	3 rd	168 (92.3%)	12 (6.6%)	2 (1.1%)	182 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square		6.757	p-value	0.149	

Table (5) shows the association between injury severity and person responsible for injury, in Dubai private schools 2012. It exhibits that most of the injuries (744) were caused by the injured student himself and 91.4% of them were mild, followed by moderate and severe (7%, 1.6%) respectively. Regarding the severe injuries, those caused by the injured student himself were more than those caused by others. This relationship was statistically significant as $p = .000$

Table 5. Association between (person responsible for injury, injured part and weather) injury severity in Dubai private schools, 2012.

Responsible person		Degree of severity of injury			Total
		Mild	Moderate	Severe	
		Responsible person	Himself	680 (91.4%)	52 (7.0%)
Others	209 (81.6%)		38 (14.8%)	9 (3.5%)	256 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square		18.379,*	p-value	0.000	

Table (6) shows the association between injury severity and weather when injury occurred. It demonstrates that almost 80% of injuries occurred in fine weather and 89.4% of them were mild, and least 2.2% were severe. In contrast, only 2 injuries occurred when the weather was rainy and both were mild. This relationship was not statistically significant as $p = .756$

Table 6. Association between weather and injury severity, Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Weather	Fine	723 (89.4%)	68 (8.4%)	18 (2.2%)	809 (100%)
	Cloudy	6 (85.7%)	1 (14.3%)	0	7 (100%)
	Rainy	2 (100%)	0	0	2 (100%)
	Windy	14 (77.8%)	4 (22.2%)	0	18 (100%)
	Foggy	7 (100%)	0	0	7 (100%)
	other	137 (87.3%)	17 (10.8%)	3 (1.9%)	157 (100%)
	Total	889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi squar	6.676	p-value	0.756		

Table (7) shows the association between injury severity and its place of occurrence. It reveals that almost half of all injuries occurred in the playground and 88.7% of them were mild and only 2.1% were severe. Then comes injuries occurring in other places such as stairs, gymnasium, bus parking areas, toilets and laboratories where injuries were about 265 from which 83% were mild and only 2.6% were severe. Regarding the severity, playgrounds had the highest number of injuries.

Table 7. Association between places of injury severity, Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Place of injury	Classroom	384 (89.3%)	35 (8.1%)	11 (2.6%)	430 (100%)
	Play ground	463 (88.7%)	48 (9.2%)	11 (2.1%)	522 (100%)
	Other	40 (83.3%)	7 (14.6%)	1 (2.1%)	48 (100%)
Total	887 (88.7%)	90 (9.0%)	23 (2.3%)	1000 (100%)	
Chi square	2.431	*p-value	0.657		

Table 8. Association between causes of injury and injury severity.

		Mild	Moderate	Severe	Total
Causes of injury	Inadequate supervision	83 (83.8%)	15 (15.2%)	1 (1.0%)	99 (100%)
	School safety	336 (92.3%)	17 (4.7%)	11 (3.0%)	364 (100%)
	Bravado behavior	261 (88.5%)	32 (10.8%)	2 (0.7%)	295 (100%)
	Exhaustion	90 (81.1%)	16 (14.4%)	5 (4.5%)	111 (100%)
	Not sure	119 (90.8%)	10 (7.6%)	2 (1.5%)	131 (100%)
Total	889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)	
Chi square		26.471	*p-value	0.001	

Dubai private schools, 2012

Table (8) shows the association between injury severities it causes. It showed that school safety was the most frequent cause (364) of injury occurrence in the study sample. Most of

it (92.3%) was mild injuries. In contrast, the least cause that might contribute in injury occurrence is inadequate supervision (99) and most of it also was mild injuries.

Table (9) shows the association between injury severities its types. It demonstrated that falls accounted for almost half of the injuries and 87.8% were mild. On the other hand, choking was the least type seen at school levels as they were only two cases but were severe.

Table 9. Association between types of injuries and injury severity, Dubai private schools, 2012.

		Mild	Moderate	Severe	Total	
Types of injuries	Fall	511 (87.8%)	58 (10.0%)	13 (2.2%)	582 (100%)	
	Drowning	36 (94.7%)	0	2 (5.3%)	38 (100%)	
	Accidental poisoning	11 (84.6%)	2 (15.4%)	0	13 (100%)	
	Accidental choke	0	0	2 (100%)	2 (100%)	
	Bum	43 (84.3%)	8 (15.7%)	0	51 (100%)	
	Cut	114 (88.4%)	15 (11.6%)	0	129 (100%)	
	Electrical shock	47 (100%)	0	0	47 (100%)	
	Animal/insect bite	39 (100%)	0	0	39 (100%)	
	others	88 (88.9%)	7 (7.1%)	4 (4.0%)	99 (100%)	
	Total	889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)	
	Chi square	120.5	*p-value	0.000		

5. Discussion

The incidence of unintentional injuries among school students is high but the severity is a minority. As for types of injuries in this study, it was seen that falls (P=.000) account for half of all types of injuries (58.2%). This result was similar to a study held in Ismailia in Egypt on 1303 students of grade 6-8, where falls accounted for about 26%, which were most frequent types of injuries.²⁰ These results also were similar to a study held in Saudi Arabia about pattern of injuries among children, and with a sample of 1650 aged <18years old. It showed that falls are the most common type of injuries in their sample as it was about 40.4%.²¹ In researcher's view, being in the school environment is as a place where students can spend their full energy and this is done by engaging in different activities such as playing mostly in playgrounds and the most possible and expected type of injury to occur in there is a fall.

This study also found that mostly the responsible person for causing the injury was the student himself as it was statistically significant with a p=.000. As per the researcher's thoughts, this may be due to aggressiveness of the youth and

high boosts of energy in them which makes them to engage themselves in each single activity even without thinking of its consequences on their health. This finding was similar to that of the France study which was mentioned above.²² They found that students who were less calm and easily irritated were injuring themselves most of the time. The researchers in that study referred this to personality traits which they clearly stated in their results, but this was not mentioned in the current study but may still be the case here as well.

By noticing the causes of the unintentional injuries it was showed in the current study that most of the injuries occurred due to school safety factors, as it accounted for about 364 of the 1000 injuries and $p = .001$. This may be due to the reason that some of the schools were not having a proper play ground with complete safety measures for performing physical activities. Some other schools had the bad construction of stairs that resulted in falls in most of the students in the sample group. This was different from the causes listed in the France study.²² They concluded that exhaustion was the main cause of school injuries in their sample population which in turn lead to lack of attention, lack of risk of awareness, lack of experience, nervous irritation and weaker physical abilities making the student prone to injuries.

6. Conclusion

The incidence of unintentional injuries is high, but severe cases are minority. Factors that may contribute to severity are the student himself, the playground and falls. Health education and school environment need to be given more importance in the planning for prevention programs.

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