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Personal Profiles of Accidental Injuries Cases 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 personal characteristics of unintentional injury cases and risk of severity 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:* By noticing the association between injury severity and age it's apparent that each age group is having the mild injury as the most common one than moderate and severe. So for 12, 13 age group, out of 573 injuries most of them 86.2% are mild and least (2.4%) are severe. For 14, 15 age group, from 315 injuries, 94% are mild, and only 3% are severe. For 16, 17 age group, which is about 112, 99% are mild injuries and 4% are severe. For the association between injury severity and sex, it was seen that in both sex the most dominant type of injury was the mild injury about 89.6% in male and 86.8% in females. On the other hand, the severe injury was the least pronounced one in both sex forming 15% in male and 6% in females. As per the nationality association with the injury type, it can be noticed that both nationalities have the mild injuries the most common one, 90.3% in UAE nationals and 88.4% in non-UAE nationals. *Conclusions:* Among the personal factors age of the student (age group of 12,13), and number of siblings (having 3-4 siblings) were involved in causing unintentional injuries. These factors should be taken into consideration when planning for prevention and control programs.

Keywords

Personal Characteristics, Risk of Severity, Accidental Injuries, Schools, Dubai

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1. Introduction

Unintentional school injuries have gained great importance in the field of Public health worldwide as it affects the student population from many aspects and raises the burden of direct medical costs on the health settings.

As injuries have been accepted as a preventable public health problem over the past decade, preventable strategies have been developed and consequently human death tolls have decreased accordingly in some countries.[1]

WHO issued a report showing that unintentional injuries were responsible for 3.9 million deaths and over 138 million disability-adjusted life years in 2004, with over 90% of them in low and middle income countries (LMIC).[2]

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Child injuries are a problem of growing concern globally, as hundreds of thousands of children die due to violence, or injury and millions suffer from non-fatal injuries.[3]

Childhood injuries along with violence are blamed to be the major killers of children throughout the world, responsible for 950,000 deaths in children and young adults less than 18 years.[2]

UNICEF in-cooperation of WHO issued a report in 2008 on child injury prevention. One of its aims was to raise awareness about magnitude, risk factor and impacts of childhood injuries worldwide.

Unintentional injuries account for 90% of deaths among children and adults less than 18 years.[3] Despite this fact, the actual statistics on childhood injuries are partial and fragmented as many injuries go unreported so the real burden of injuries in children is under estimated[4]. With the combined impact of disproportionately early mortality, the need for critical and costly medical care, and the risk for extended periods of disability, traumatic injuries present a staggering cost burden to individuals, families, the medical system, and governments.

Injuries are linked to activities, conditions and the environment, and are also associated with certain individual characteristics such as age, sex, and physical ability, lack of knowledge, personality, behavior, and family characteristics.[4] Smoking, alcohol use, health status and sleep disorders are known to affect physical and mental abilities and increase the risk of injury in adults, and these factors may also lead to school injuries. The increased risk may also be due to the conditions for which youngsters are taking the drugs. School marks may also be associated with injuries because they may indicate the student's capacity for certain school activities. Knowledge of the role of these factors may be useful for injury prevention and for school physicians, parents and school staff to raise student awareness of the risks and to find remedial measures.[5]

2. Objectives

To study the personal characteristics of unintentional injury cases and risk of severity among student at private schools in Dubai.

3. Methodology

A Cross sectional design was utilized to study unintentional injuries in Dubai's private schools, among Students of grade 7–12 both males and females in the academic year 2012-2013. The study went through two phases. The first was utilized to estimate incidence rate of injuries where the total injuries took place in the schools in 2012 divided by total students population in the studied schools in the same year multiplied by 1000, The second was to study the determinants of severity through randomly selecting 1000 cases of injuries out of the total numbers of injuries.

Sample size was calculated using computer program EPI-Info version "6.04", and based on the total number of private school students in Dubai which was 207,500, percent of injuries of 50%, 3% of precision, 1.5 design effects and 95% confidence interval. The minimal sample size was 1000 students. Multistage stratified random sample with proportional allocation was carried out. 5 schools were selected from Deira and 5 from Bur Dubai respectively randomly.

A reportable injury is defined as an injury meeting at least one of the following criteria :(1) an injury for which the student received medical treatment at the school nurse's office, or received medical care from a doctor at a hospital or a private medical office, (2) an injury for which the student received first aid from his/her schoolmates, teachers, or parents, or (3) an injury that was not treated but caused the student to miss a half day or more of school or regular activities.[6]

The questionnaire was adopted and modified from a validated and reliable questionnaire composed of 32 items from a study held in China.[8] It was reliable and validated as Cronbach's α coefficient of reliability is 0.78 in this study. It's composed of several sections about socio-demographic data, lifestyle behavior, and injury status. The English questionnaire was reviewed by community medicine consultants and translated into Arabic language.

Mild and Moderate injuries are defined as injuries treated within the school either with a colleague student, a teacher or the school nurse or doctor.[9]

The data was collected from students in schools within their classes during the official study hours by self-administered questionnaire. It took half an hour of their time.

Statistical analysis was fulfilled through SPSS software version "19". Several statistical tests were used. Chi square test was used for testing the association between severity of injury (mild, moderate and severe) and most of the variables such as age, gender, nationality, parent's educational level, family income). Binary regression model was adopted to analyse significant variables.

Ethical considerations:

- Absolute confidentiality of the information obtained in the study was ensured throughout the research.
- Ethical approval from the ethical committee in Dubai

Health Authority (Medical Research Committee: MRC) was obtained prior to commencing the research.

- Verbal consent was obtained from each student in the study.

4. Results

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

		Frequency	Percent
Injury severity	Mild	889	88.9%
	Moderate	90	9.0%
	Severe	21	2.1%
Total		1000	100.%

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 3. Association between (gender, nationality and age) and injury severity in Dubai private schools, 2012.

		Injury severity			Total
		Mild	Moderate	Severe	
Gender	Male	665 (89.6%)	62 (8.4%)	15 (2.0%)	742 (100%)
	Female	224 (86.8%)	28 (10.9%)	6 (2.3%)	258 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square 1.57 p-value .454					
Nationality	UAE	251 (90.3%)	24 (8.6%)	3 (1.1%)	278 (100%)
	Non UAE	638 (88.4%)	66 (9.1%)	18 (2.5%)	722 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square 2.052 p-value .358					
Age	12-13	494 (86.2%)	65(11.3%)	14 (2.4%)	573 (100%)
	14-15	296(64%)	16(5.1%)	3(1%)	315(100%)
	16-17	99(88.4%)	9(8%)	4(3.6%)	112(100%)
Total		889(88.9%)	90(9%)	21(2.1%)	1000(100%)
Chi square 13.824 * p-value .008					

Table 3. shows the association between injury severity and variables such as age, gender and nationality in Dubai private schools in 2012. By noticing the association between injury severity and age it's apparent that each age group is having the mild injury as the most common one than moderate and severe. So for 12, 13 age group, out of 573 injuries most of them 86.2% are mild and least (2.4%) are severe. For 14, 15 age group, from 315 injuries, 94% are mild, and only 3% are severe. For 16, 17 age group, which is about 112, 99% are mild injuries and 4% are severe. This means that as the age increases, the injuries decrease with it. By looking at the frequencies of injuries in each age group, it's clear that the youngest group,12,13, have the higher amount of injuries (573) compared to other groups which form 315 in age group 14,15and 112 in 16,17 age group. For the association between injury severity and sex, it was seen that in both sex the most dominant type of injury was the mild injury about 89.6% in male and 86.8% in females. On the other hand, the severe injury was the least pronounced one in both sex forming 15% in male and 6% in females. As per the nationality association with the injury type, it can be noticed that both nationalities have the mild injuries the most common one, 90.3% in UAE nationals and 88.4% in non-UAE nationals.

Table 4. demonstrates the association between injury severity and number of siblings of the injured student. It can be noticed that most of the injuries (600) occurred in students with 3-4 siblings, in which 89.2% of the had mild injuries and only 2.2% severe injuries. On the other hand, the lowest injuries occurred in students with 0-1 sibling (25), 80% of it was mild injuries. This relationship was statistically significant as p-value was .000.

Table 4. Association between number of siblings and injury severity in Dubai private schools, 2012.

		Degree of severity of injury			Total
		Mild	Moderate	Severe	
Siblings	0-1	20 (80%)	0	5 (20%)	25 (100%)
	2-3	170 (92.4%)	14 (7.6%)	0	184 (100%)
	3-4	535 (89.2%)	52 (8.7%)	13 (2.2%)	600 (100%)
	4-6	126 (86.3%)	19 (13%)	1 (0.7%)	146 (100%)
	>6	38 (84.4%)	5 (11.1%)	2 (4.4%)	45 (100%)
Total		889 (100%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square 50.838 * p-value .0000					

Table 5. Association between and rank of injured student among his siblings and injury severity in Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Rank	Youngest	13 (100%)	0	0	13 (100%)
	Second	270 (89.4%)	28 (9.3%)	4 (1.3%)	302 (100%)
	3rd or later	306 (88.4%)	31 (9.0%)	9 (2.6%)	346 (100%)
	Eldest	264 (88%)	31 (10.3%)	5 (1.7%)	39 (100%)
	Only child	36 (92.3%)	0	3 (7.7%)	39 (100%)
Total		889 (88.9%)	90 (9%)	21 (2.1%)	1000 (100%)
Chi square 13.201 p-value .105					

Table 5. shows the association between injury severity and rank of the injured student among his siblings. It revealed that almost one third of the injuries (346) occurred in students who were third or later in rank among their siblings. And from these injuries about 88.4% were mild and only 2.6% severe. In contrast, the youngest students among their siblings had the least injuries (13) and all of them were mild.

This relationship was not statistically significant as the p = .105

Table 6. Association between whom the student lived with and injury severity, Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Living	Both parents	800 (89.3%)	79 (8.8%)	17 (1.9%)	896 (100%)
	Father	20 (87%)	3 (13%)	0	23 (100%)
	Mother	41 (83.7%)	4 (8.2%)	4 (8.2%)	49 (100%)
	Others	28 (87.5%)	4 (12.5%)	0	32 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000(100%)
Chi square 11.016 p-value .088					

Table 6. shows the association between injury severity and whom did the injured student lived with. It demonstrates that almost 80% of the injured students lived with both parents and from this 89.3% had mild injuries and only 1.9% had severe injuries. Whereas, less than one fourth of all injured students lived with their fathers and 87% of them had mild injuries. This relationship was not significant as the p = .088.

Table 7. shows the association between injury severity and study level of the injured student. It revealed that almost half of the students (485) had level of (75-84%) and about 87% of them had mild injuries. Follows students with level of (85% and above) who were about 445 and 91.9% of them had mild injuries and only 2.0% severe injuries. This relationship was not statistically significant as the p = .048.

Table 8. shows the association between injury severity and study hours of the injured student. It can be noticed that most of the injured students (614) studied for about 2-4hours/day and 89.1% of them had mild injuries. On the other hand, only 71 students studied for <1hour and 83.1% of them had mild injuries. This relationship was also not statistically significant as p = .022.

Table 7. Association between student's study level and injury severity in Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Study level	85% and above	409 (91.9%)	27 (6.1%)	9 (2.0%)	445 (100%)
	75-84%	422 (87%)	53 (10.9%)	10 (2.1%)	485 (100%)
	below 75%	58 (82.9%)	10 (14.3%)	2 (2.9%)	70 (100%)
Total		889 (88.9%)	90 (9%)	21 (2.1%)	1000 (100%)
Chi square 9.571 * p-value .048					

Table 8. Association between student's study hours and injury severity in Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Study hours	< 1hour	59 (83.1%)	12 (16.9%)	0	71 (100%)
	2-4hours	547 (89.1%)	49 (8.0%)	18 (2.9%)	614 (100%)
	4-8hours	283 (89.9%)	29 (9.2%)	3 (1.0%)	315 (100%)
Total		889 (88.9%)	90 (9%)	21 (2.1%)	1000 (100%)
Chi square 11.44 * p-value .022					

Table 9. Association between student's grade and injury severity in Dubai private schools, 2012.

		Degree of severity of injury			Total
		Mild	Moderate	Severe	
Grade	7,8	296 (84.6%)	44 (12.6%)	10 (2.9%)	350 (100%)
	9,10	311 (90.1%)	30 (8.7%)	4 (1.2%)	345 (100%)
	11,12	282 (92.5%)	16 (5.2%)	7 (2.3%)	305 (100%)
Total		889 (88.9%)	90 (9%)	21 (2.1%)	1000 (100%)
Chi square 13.46 * p-value .009					

Table 9. shows the association between injury severity and grade of the injured students. It revealed that about one third of the injured students (350) were from grade 7, 8 and 84.6% of them had mild injuries. On the other hand, another one third of the students were from grade 9, 10 of whom 90.1% had mild injuries. Students from grade 11, 12 also formed about one third of all injured students as 92.5% of them were mildly injured. Here students from all grades were equally injured but moderate and severe injuries mostly occurred in grade 7, 8 students about 12.6% and 2.9% respectively.

Table 10. shows the association between injury severity and the medical status of the injured students. It revealed that almost 95% of all injured students were medically fit and 89.1% of them had mild injuries, follows moderate injuries (8.6%) and severe injuries (2.1%). Among the unfit students, most of them 86.6% had mild injuries and only 13.4% moderate ones. This relationship was not statistically significant as p =.145.

Table 10. Association between medical status of injured students and injury severity in Dubai private schools, 2012

		Degree of severity of injury			Total
		Mild	Moderate	Severe	
Medical status	Fit	818 (89.1%)	79 (8.6%)	21 (2.1%)	918 (100%)
	Unfit	71 (86.6%)	11 (13.4%)	0	82 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square 3.864 p-value .145					

Table 11. Association between injured part and injury severity, Dubai private schools, 2012.

		Mild	Moderate	Severe	Total
Injured part	Head or face	139 (92.7%)	9 (6.0%)	2 (1.3%)	150 (100%)
	Neck	40 (88.9%)	3 (6.7%)	2 (4.4%)	45 (100%)
	Chest or belly	3 (60%)	0	2 (40.0%)	5 (100%)
	Waist or back	33 (86.8%)	5 (13.2%)	0	38 (100%)
	Upper body	268 (87.6%)	28 (9.2%)	10 (3.3%)	306 (100%)
	Lower body	350 (91.4%)	29 (7.6%)	4 (1.0%)	383 (100%)
	>one part of body	56 (76.7%)	16 (21.9%)	1 (1.4%)	73 (100%)
Total		889 (88.9%)	90 (9.0%)	21 (2.1%)	1000 (100%)
Chi square 6.676 p-value .756 Chi square 6.676 p-value .756					

Table 11. shows the association between injury severity and injured part of body of the injured students. It revealed that one third of the injuries (383) occurred in the lower parts of the body, of them 91.4% were mild. In contrast, only 5 of the injuries occurred on belly/chest and 60% of these were mild. This relationship was statistically not significant as p = .756.

5. Discussion

This study revealed that the incidence rate of unintentional injuries among secondary and preparatory students in Dubai for 2012 to be (296/1000). This incidence rate is higher than what has been reported in Oman (26.3%) by Oman Global School Based Student Health Survey (GSBHS) done through WHO and CDC in 2005. This figure was lower than the figures obtained in Tunisia (37.2%) by Tunisia GSBHS in 2006, Egypt (38.5%) by Egypt GSBHS (2006), and Yemen by Yemen GSBHS (2008) (70.4%).[7] It can be noticed that among most of the Arab countries, UAE lies at the bottom end in field of unintentional injuries among children. As researcher's point of view, this could be due to higher school safety levels and high awareness levels of students about injuries at schools and proper health education delivered to students. It is also explained by the process of standardization and accreditation the government imposed on all school in Dubai emirate.

The current study results shows an inverse relationship of injury rate and age as the youngest age group of 12-13 years had about 57.3% of injuries compared to other age groups. This goes with the results of a study held in France in 2007(Determinants of school injury proneness in adolescents: a prospective study), also agreed with this fact in 2007.[5] They found in it that frequent injuries were common and were strongly associated with younger age as they had 18% of

injuries in age group of 12 and less. This shows that age is an important factor in unintentional school injuries among children. As the researcher thinks this may be due to their inability to judge about consequences of different movements or activities they engage themselves in with or without an adult.[8] In contrast another study held in Finland on a student sample of 1135 of age group7-15, aiming at analysis of gender differences in injuries in Finland schools showed that as the age increases of the student his risk of injury also increases. They explained this by having boys to decrease their control over their body by puberty or risk taking behavior tendencies increase with age.[9]

For the gender, the study revealed that there was no statistically significant difference between male and female as the p= .454. In the researcher's point of view, this may be due to low incidence rate of the current study compared to that of other international studies. This result is different from some other studies such as the one held in China by Huan *et al*. about unintentional injuries at school with population of 10,000 students attending 6 primary and 4 middle schools selected randomly. They had a statistically significant result with p=.023 for gender being a risk factor in injury occurrence.[10]

Among the positive findings in the current study was association of injuries with the students study mark, with a p-value of .048 with most of the injuries occurring in students with study marks of 85% or higher. As per the researcher's justification, this may be referred to the high IQ levels of them which makes them involve themselves in more than one activity at a time, doesn't matter if mental or physical leading them to face these types of injuries. This observation was disagreed with the France study which showed that poorer average school performance was a risk for frequent injuries.[5]

The current study also showed that presence of older siblings increased the risk of having unintentional injuries as the p=. 000. This may be due to, as the researcher thinks, inability of the parents to cover all of their children with the same level of care and education about different things for e.g. avoidance of unintentional injuries at schools. Besides, the younger child with less developed motor skills and judgment may attempt to keep up with the older siblings leading to injury. This result was similar to one study held in USA about effect of an older sibling on the risk of childhood injury; it was a case control study. They had cases of 3145 injuries and among them 66% were having older siblings.[11]

6. Conclusions

Among the personal factors age of the student (age group of 12,13), and number of siblings (having 3-4 siblings) were involved in causing unintentional injuries. These factors should be taken into consideration when planning for prevention and control programs.

References

[1] The Injury Chart Book. Geneva.WHO.2002. Available at: http://whqlibdoc.who.int/publications/924156220X.pdf. Accessed 5/21/2012, 2012.

[2] WHO the global burden of disease: 2004 update Available at: http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html. Accessed 5/21/2012, 2012.

[3] UNICEF. World Report on Child Injury Prevention.UNICEF.2008. Available at: http://www.unicef.org/eapro/World_report.pdf. Accessed 5/21/2012, 2012.

[4] Guidelines for school health programs to prevent unintentional injuries and violence: summary. Available at: http://www.cdc.gov/HealthyYouth/injury/pdf/summary.pdf. Accessed 4/20/2012, 2012.

[5] Chaua N., Predined R., Benamghard L., Michaely J., Choquet M., Predined E. Determinants of school injury proneness in adolescents: a prospective study. Journal of the Royal Institute of Public Health 2008; 122: 801-808.

[6] Roudsari BS, Ebel BE, Corso PS, et al. The acute medical care costs of fall-related injuries among the U. S. older adults. Injury 2005; 36(11):1316-1322. Cross Ref Medline Web of Science.

[7] Saran NA. Non-intentional Injuries in Adolescents and Youth: Facts and Figures. Bahrain Medical Bulletin 2012:34:1.

[8] National Center for Injury Prevention and Control: Injury Fact Book 2001-2002 Atlanta, GA: Centers for Disease Cotrol and Prevention; 2001.

[9] Salminen S., Lounamaa A., Kurenniemi M. Gender and injury in Finnish comprehensive schools. Accident Analysis & Prevention 2008 7; 40(4):1267-1272.

[10] Sun Y., Yu IT, Wong TW, Zhang Y., Fan YP, Guo SQ. Unintentional Injuries at School in China-Patterns and Risk Factors. Accident Analysis and Prevention 2006:38:208-214.

[11] Nathens AB, Nev MJ, Gos CH, Maier RV, Rivara FP. Efect of an older sibling and birth interval on the risk of childhood injury. Injury Prevention2000; 6:219–222.