Queensland Injury Surveillance Unit

INJURY BULLETIN

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Injuries at School

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QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland.

QISU publications and data are available on request for research, prevention and education activities.

HOSPITALS:
Mater Children's, Mater Adult, Queen Elizabeth II Jubilee, Princess Alexandra, Redland, Logan, Royal Children's, Mt Isa , Mackay Base, Mackay Mater, Sarina, Proserpine, Clermont, Dysart and Moranbah.

QISU Web Site
www.qisu.qld.gov.au

Summary

- 14% of injuries to school– age children occur at school, 46% at home
- Falls were the most common cause of injury and resulted in the most severe injuries
- Two thirds of the recorded injuries occurred in children aged 5 to 12 years
- Children at pre-school and primary school were most often simply playing when injured while at high school sport was the most frequent activity
- Play equipment was a frequent injury factor for younger children with horizontal ladders or climbing frames related to 14% of preschool and 10% of primary school injuries
- One-third of all of the injuries were fractures, 27% were sprains or strains

Introduction

After the home, school is the most frequent location for injury amongst school age children with around 15% of emergency department (ED) presentations for injury in this age group occurring on school premises. This relatively high number of injuries within an educational institution lends itself to interventions that not only reduce the frequency of injuries within this setting but also help establish lifelong safety skills in young people.

This analysis will assist in identifying the characteristics of injuries that occur frequently in our schools. It examines the circumstances and nature of ED presentations for injury to QISU participating hospitals, 1998-2000, for 3 to 17 year olds where the location was reported as a kindergarten, pre-school, primary or secondary school. Child care centres were not included nor were school related injury which occurred outside the school premises such as those occurring during travel to and from school or on school excursions or camps.

Results

For the three years 1998 to 2000 there were 6946 injury presentations for children aged 3 to 17 years to participating hospital EDs where the location of injury was reported as a pre-school, kindergarten, primary or secondary school, comprising 14% of all injury presentations in this age group. The largest proportion of

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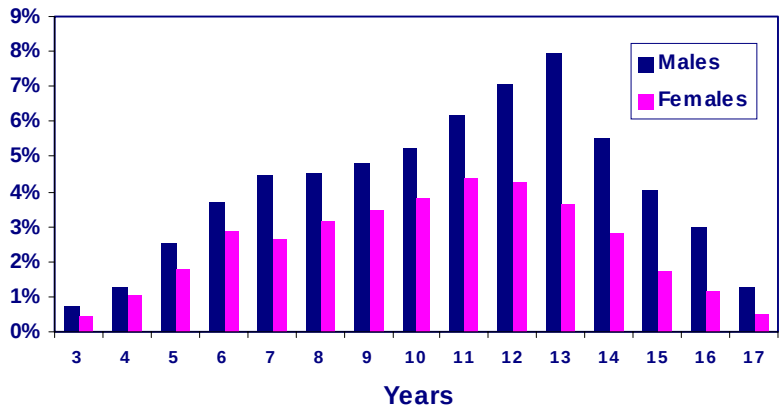

Figure 1 QISU Emergency Department presentations, school injuries 1998-2000, by age and sex.

injuries were associated with primary school (59%) followed by secondary (36%) and pre-school and kindergarten (5%).

Age and gender

The proportion of school injury victims increased steadily with age peaking at 13 years for males and 11 years for females. Two thirds of the injuries involved children aged 5 to 12 years. Over all ages there were five male victims to every three females although this ratio increases with age from 1.2 at age 4 years to 2.6 at age 16 (Figure 1).

External cause

The most common external cause of injury for all school types was low falls (<1m) (43%) followed by struck by or collision with object (16%) and struck by or collision with person (14%). However this pattern was not observed over all school types. For preschools and kindergartens following low falls, high falls (>1 m) were the next most prevalent cause (14%) and for primary schools high falls were the third most prevalent external cause (13%). For secondary school victims high falls were relatively rare (4%) while being struck by or in collision with a person was much more common (19%).

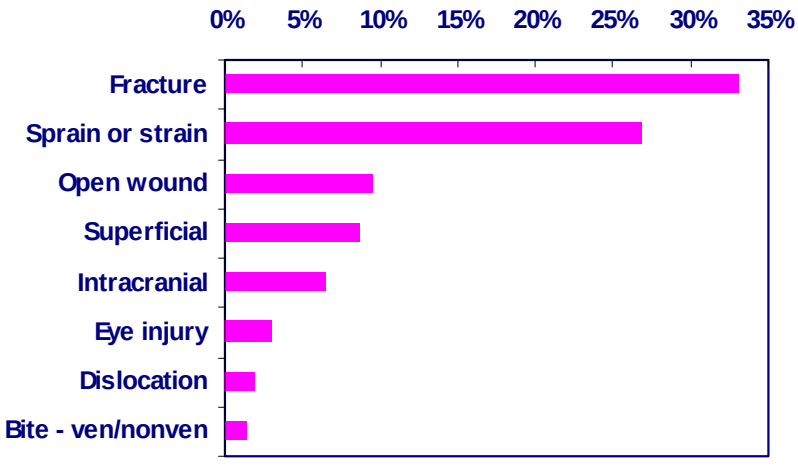

Figure 2 QISU Emergency Department presentations, school injuries by nature of injury, 1998-2000

Activity

Overall the most common activity reported was playing (29%) followed by sport (28%), and engaged in formal education (20%). Between school types the activities reported varied with the proportion described as playing, as expected being greatest in the kindergarten and preschool group (59%) and least amongst the secondary school victims (11%). The reverse was true for those described as engaged in formal education and for sporting activities. Of the sporting activities reported the most prevalent code identified was soccer (6%) followed by football unspecified (3%), basketball (3%), rugby league (2%) and netball (2%) (Figure 3).

Location

Only 7% of school injuries were described as occurring in the classroom with the majority taking place in exterior locations. For preschool and kindergarten injury victims the most common location was described as playground - with play equipment (41%) followed by other exterior (12%) and playground - without play equipment (11%). However for secondary students the most frequent locations were other exterior (30%), playground – without play equipment (25%) and other interior (10%).

Main injury factor

Although for all injuries the most frequent injury factor mentioned was 'person' (14%) within school types this was not the case. For preschool and kindergarten students the most prevalent injury factor reported was horizontal ladder (monkey bar) or climbing frame (14%) followed by other play equipment (11%) slide (5%) and other structure (4%). For primary school students the most common injury factors were person (11%), horizontal ladder or climbing frame (10%) natural surface (8%) and ball (8%) while for secondary students the factors were person (19%), natural surface (11%), ball (10%) and other structure (8%) (Figure 4).

Nature and body location of injury

For all school types the three most common injuries resulting in presentation to an ED were fracture, sprain or strain or open wound with the

Activity	All N	All %	Preschool N	Preschool %	Primary N	Primary %	Secondary N	Secondary %
Playing	2031	29%	187	59%	1557	38%	287	11%
Engaged in formal education	1399	20%	20	6%	697	17%	682	27%
Other sport or leisure	670	10%	12	4%	341	8%	298	12%
Football - Soccer	384	6%	1	0%	265	6%	118	5%
Resting, eating, sleeping etc	268	4%	20	6%	152	4%	96	4%
Football - Unspecified	230	3%	1	0%	88	2%	141	6%
Basketball	201	3%	3	1%	65	2%	133	5%
Football - Rugby League	116	2%	0	0%	55	1%	61	2%
Netball	109	2%	1	0%	67	2%	41	2%
Cricket	69	1%	1	0%	41	1%	27	1%
Track and field	64	1%	0	0%	35	1%	29	1%
Football - Rugby Union	47	1%	0	0%	11	0%	36	1%
Gymnastics	46	1%	0	0%	15	0%	31	1%
Football - Touch	39	1%	0	0%	15	0%	24	1%
	6946		318		4084		2544	

Figure 3 QISU Emergency Department presentations, school injuries by activity, and school level 1998-2000

Main Injury Factor	All N	All %	Preschool N	Preschool %	Primary N	Primary %	Secondary N	Secondary %
Person	941	14%	9	3%	440	11%	492	19%
Natural surface	598	9%	4	1%	318	8%	276	11%
Ball	576	8%	4	1%	313	8%	259	10%
Other structure	513	7%	13	4%	294	7%	206	8%
Horizontal ladder/ climbing frame	475	7%	45	14%	423	10%	7	0%
Other natural object or animal	367	5%	14	4%	223	5%	126	5%
Other sporting equipment	226	3%	8	3%	111	3%	98	4%
Other play equipment	175	3%	34	11%	134	3%	7	0%
Brick, concrete, etc	167	2%	7	2%	100	2%	60	2%
Other material	112	2%	8	3%	56	1%	48	2%
Tree	106	2%	2	1%	85	2%	19	1%
Floor	99	1%	5	2%	43	1%	51	2%
Rock, stone, gravel etc	95	1%	4	1%	62	2%	29	1%
Chair, stool	89	1%	6	2%	57	1%	26	1%
Fence, gate	66	1%	5	2%	40	1%	21	1%
Wood	63	1%	5	2%	40	1%	18	1%
Slide	60	1%	17	5%	42	1%	1	0%
Metal	60	1%	2	1%	33	1%	25	1%
Swing	39	1%	10	3%	27	1%	2	0%
Total	6946		318		4084		2544	

Figure 4 QISU Emergency Department presentations, school injuries by major injury factor, and school level 1998-00

ranking being different for each type. Fractures were the most prevalent injury in preschool, kindergarten and primary students (30% and 37%) while for the secondary group it was a sprain or strain (33%). Intracranial injuries made up around 6% of injuries in all school types (Figure 2).

A quarter of the injuries, of which most were fractures, were to the forearm or wrist followed by the hand (16%) and head or face (15%). Amongst the different school types, differences in injury location reflecting the different injury factors were observed. For example hand injuries were more prevalent amongst secondary students (22%) reflecting the frequency of ball related injuries in this group while for the other types there was a higher number of forearm injuries relating to falls from play equipment.

Severity

The admission rate varied from 22% for kindergarten and pre-school victims to 17% for primary and 9% for secondary student. Similarly the proportion with triage category urgent or higher was 37% for kindergarten and pre-school, 36% for primary and

30% for secondary school victims. The greater severity amongst younger school students was due largely to the higher proportion of fractures in this group.

Discussion

Injuries occurring in schools reflect the age and activities of children and encompass a wide range of injury factors. Consistent with other settings, falls are a major cause of injury.

Within kindergarten, pre-school and primary school, play related injury, mainly falls, was the predominant feature particularly that associated with play equipment. The resulting, frequently severe injuries, often fractures, contributed to the higher admission rates for younger children. The large number of injuries associated with falls from horizontal ladders amongst younger students may reflect the high usage of this type of equipment but remains a concern. Play equipment injuries were examined recently in a QISU Injury Bulletin.[1]

Amongst older primary and secondary students injury associated with sporting activities became more prevalent. The issue of sport related injuries in the wider community was also examined in a previous bulletin.[2]

Injuries due to aggressive behaviour particularly in males has been cited as a significant cause of injury in schools with between 13% and 25% of injuries being attributed to intentional acts. [3] However it is also reported that these injuries are almost always attributed to sporting and other activities, a finding consistent with this analysis which found very low rates of reported intentional injury (2%).

Kidpower provides a holistic approach to injury control and addresses curriculum, teaching and learning, school organisation, ethos and environment, and school partnerships and services.
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Prevention

Due to the wide range of injury factors involved in school related injury over different school levels and different child developmental stages a variety of targeted interventions are necessary to effectively reduce injuries in this setting.

Recently in the US the Centres for Disease Control released guidelines to prevent unintentional injury and violence in schools.[4] These guidelines include recommendations relating to the following eight aspects of school health efforts to prevent unintentional injury, violence, and suicide:

- a social environment that promotes safety;
- a safe physical environment;
- health education curricula and instruction;
- safe physical education, sports, and recreational activities;
- health, counselling, psychological, and social services for students;
- appropriate crisis and emergency response;
- involvement of families and communities; and
- staff development to promote safety and prevent unintentional injuries, violence, and suicide.

Elsewhere integrated programs to reduce injury in schools have been implemented and evaluated. An evaluation of a program to minimise injury targeting 10 and 11 year olds introduced in the UK found that the intervention increased injury prevention knowledge and modified attitudes and behaviour. [5] While in New York a multidimensional program to prevent injuries has been implemented in public schools since 1998. [6]

In this state, Queensland Health developed 'Kid Power', a program based on a health-promoting schools framework, to reduce injury in schools. This program targets 10 to 14 year-olds and has been successfully trialed in four schools. In addition Education Queensland last year launched an electronic health and safety system in schools to facilitate improved management of health and safety issues including hazard identification.

These measures and other programs targeting child injury in the whole community , particularly falls, may facilitate a reduction in injury in this significant population at risk. In doing so it is vital that a balance between essential physical activity and injury prevention is obtained.

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