COMMON SPORT INJURIES OF CHILDREN IN HONG KONG

BY

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30TH APRIL, 2013

We hereby recommend that the Honours Project by Mr. Chan Kin Fung entitled “Common Sport Injuries of Children in Hong Kong” be accepted in partial fulfillment of the requirements for the Bachelor of Arts Honours degree in Physical Education and Recreation Management.

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DECLARATION

I hereby declare that this Honours project “Common Sport Injuries of Children in Hong Kong” represents my own work and had not been previously submitted to this or other institution for a degree, diploma or other qualification. Citations from the other authors were listed in the references.

______________________________
Chan Kin Fung

30th April 2013
ACKNOWLEDGEMENTS

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ABSTRACT

The aim of this study was to investigate the sport injuries situation among Hong Kong primary and secondary students. Besides, it aimed to examine the different injuries conditions between primary (i.e. aged 6-12) and secondary (i.e. 13-18) students and genders. Moreover, it aimed to discover the body part of injuries, the causes, the time and the occasion that all the factors will lead to injuries.

A total of 150 students were participated in the study. Among those students, the most popular injury sports were basketball, soccer and volleyball. Besides, there was no significant difference between boys and girls in any sport injury situation (p>0.05) whereas there were significant difference between primary and secondary students in injury occasion, source of diagnosis and the adoption of warm up (p<0.05).
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CHAPTER 1

Introduction

It is no doubt that the increase in sport participations brings about the increase in the number of sport-related injuries. As the increase in children participating in sports, the number of children sport injury had been increased rapidly (O’Rourke, 2005). Therefore, in order to have better prevention for the children away from sport-related injuries, we must have the up-to-date data of the children’s sport injuries type and cause.

Some researchers insisted that sport injuries was affected by gender (Michaud, Renaud & Narring, 2001); (Taylor & Attia, 2000), the injury rate of boys were higher than girls in some sports. Therefore, it is vital to examine which sports leads more sport injury problem to boy and girls in order to have better prevention.

Apart from gender difference, some researchers implied that as the age increases, the rate of sport injury increases (Michaud, Rnaud & Narring, 2001; Babual, Nolan & Rajabaji, 2007). Thus, it is important to ensure the age difference in
sport injury in Hong Kong so we can have better prevention for easily suffer injury children.

On the other hand, most studies of sport related injuries are aim at adult group people rather than the childhood accidents although sport injuries will lead great impact to the children future development.

The aim of this study was to identify the risk factors in sports, which occur in different age group and different type of sport, in relation sports facilities, teaching instruction, children behavior and sport arenas which could affect the number of accidents and the level of the injuries. The preventive measures are proposed due to the risk factors.

**Statement of the Problem**

Since there was lack of previous study of the proportion of the primary and secondary school students sport injury. Therefore, the purpose of this study was to investigate the proportion of the sport injury patterns of children in Hong Kong. This study was attempted to identify the risk factors of the common sport injuries of children in Hong Kong. Moreover, the study was to provide the updated data on common sport injuries for Hong Kong school in order to have better prevention of sport related injuries.
Research Questions

1. What kind of sports is easier lead to injury?
2. Does the P.E. lesson have enough safety guidelines to follow in order to prevent injury?
3. Does doing warm-up can prevent sport related injury?
4. Is there any difference in sport injuries between boys and girls?
5. Is there any difference in sport injury between primary and secondary school student?

Definition of Terms

The definitions of the terms in this study were defined as follows:

Sports Injury

Sport injury are injuries that occur in athletic activities, sports or exercise, can be divided in acute and chronic injuries, which may result from accidents, poor training practices, and improper equipment, lacking in conditioning, or insufficient warm up and stretching. (National Institute of Arthritis and Musculoskeletal and Skin Diseases, 2009)

Children
It refers to a human between the stages of birth and puberty. It also defines as a human being below the age of 18 years old. (Oxford Dictionaries, 2013)

**Delimitations**

The followings delimitations should be considered of this research:

1. The study was conducted for a period of six months between November 2012 and April 2013.
2. The samples were chosen in five primary schools and five secondary schools, each of the school randomly deliver fifteen questionnaires.
3. Age group 6-12 was defined as primary school students, 13-18 was defined as secondary school students.
4. Incidence of injuries was delimited to the past five years.

**Limitations**

The limitations of the study were listed as follows:

1. The sample size of this study was small (N=200) of the data to a large sport injury cases.
2. The quality of the questionnaires cannot guarantee because the children may not be able to recall accurately on history of their sport injuries.
3. It was assumed that all samples were able to identify their injuries.
4. The answers given in questionnaire were assumed to be honest and reliable.

**Significance of the Study**

The significance of the study was to identify injury patterns and cause among different sports of children in Hong Kong. It provides information to the school for injury prevention. Every year, many of the children suffer sport injuries in school, sport accidents account for 27 per cent of all childhood accidents (Y. Sahlim, 1990), this study recognizing the needs for injury prevention. The schools understand more about the sport injury patterns and the cause of them so can to prevent sport related accidents occur. If schools can really prevent the sport injury occur; this may be useful for promoting different sports to the children and the parents will not reject this kind of activities. It can help children be healthier in the future.
Chapter 2

Review of Literatures

This review of literature was divided into four sections:

(1) The most common sport related injury in children, (2) the most common body part of injuries, (3) gender different in sport related injury, (4) age difference in sport related injury, (5) different type of the injuries and (6) summary.

The Most Common Sport Related Injury in Children

The most common sport related injury has been investigated by a number of researchers. Rechel, Yard, Dawn Comstock (2008) indicated that in competition, the highest rate of sport injury per 1000 Athlete-Exposures (AEs) occurred in football (12.09), followed by girls’ (5.21) and boys’ (4.22) soccer. The most common injury was sprains and strains (52.1%) and it mostly occurred in volleyball (77.3%). However, Rauh, Macera, Ming Ji, Wiksten (2007) had a research among the injuries high school girls in 5 sports (basketball, field hockey, soccer, softball, volleyball), total number of player-seasons from 5 girls’ sports during the 3-year period was 25187. Soccer (27.2%) (n=6642 player-seasons) is the most athletes reporting
multiple injuries and followed by basketball (26.4%).
Sprains and strains also are the most injuries. Similarly, O’Rourke et al. (2005) were also found that the most common sport related injury is soccer (23%). In addition, Babul, Nolan, Nolan, Rajabali (2007) indicted that cycling (20%) had the greatest proportion in non-organized sport-related injuries (SRIs). The reasons for those SRIs were collisions falls and loss control. On the other hand, Taylor and Attia (2000) indicated a research that including 677 sport related injuries, the six most common sports implicated were basketball (19.5%), and then was football (17.1%) and baseball (14.9%). And sprains/strains were most likely occurring in basketball.

The Most Common Body Part of Injuries

The most common body part of injuries has been investigated by a number of researchers. Huffman etal (2008) indicated that neck and cervical injuries is the most common sport related injury than other injuries, in total 321 people, 199 boys and girls were suffered neck and cervical injuries. It is over 50% out of the total injuries. However, a research from Taylor, Attia (2000), indicated that injuries most common occurred in wrist and hand (28%) compare with other injuries, head and face injuries (22%),
and ankle and foot injuries (18%) were fouling. On the other hand, Rauh, Macera, Wiksten (2007) found that ankle injuries were the highest injuries occurred in basketball (32.3%), soccer (36.4%) and volleyball (40.8%). Nevertheless, Rechel, Yard and Comestock (2008) also indicated that lower extremities has the highest rate of the sport injuries in both practice and competition situation which is 48.3% in football, 88.6% in soccer and 69.6% in basketball.

**Gender Difference in Sport Related Injury**

Some researchers indicated that sport related injury was affected by gender. Michaud, Renaud and Narring (2001) conducted a study between September 1996 and March 1997 in primary and secondary schools and vocational centers in Switzerland (around 600000 inhabitants). The result was about 32.1% of the participants reported having injury during the preceding 12 months (girls: 28.2%, boys: 35.9%). Boys had a higher proportion than the girls. Moreover, Taylor and Attia (2000) found that there were 480 of the patient were male (71%) within a 677 patients group. Male patients were much higher than the female. Nevertheless, Babul, Nolan, Nolan and Rajabaji also found that male sport related injuries were higher than female in both organized (66%>34%) and non-organized (71%>29%) sport related injuries.
Meanwhile, Garrick and Requa also indicated a two years study was made of injuries received in high school sports. In total four high schools to conduct the investigation. Sport related injuries occurred in women’s sports at a rate of 22 per 100 participants; men’s injuries occurred at rate of 39 per 100 participants.

**Age Difference in Sport Related Injury**

Various findings have reported sport related injuries are affected by age. Michaud, Renaud and narring indicated that children with sport injuries in elementary school (9-11 years) were rate at 20.2%; in secondary school (12-15 years) were rate at 47.8%; in high school (16-19 years) were rate at 52%. The result was that the risk of sports injury increases affected by age but with exposure to specific sports and the pubertal development. However, Taylor and Attia found that the majority of patients evaluated were in the 12-18 age group (61%), only 39% patients are come from 5-11 age group. Especially in basketball, the total injuries rate in older group were 105; in younger age group were only 28. Similarly, Babul, Nolan, Nolan and Rajabaji also found sport related injury will affected by age. Between January
1999 and December 2003, the number of total injuries was highest among children between the ages of 10-14 years (52%); the age group 5-9 years was just 21%. Meanwhile, O’Rourke et al (2005) different age group would affect the proportion of sport related injury. The highest proportion of male was 14 years (14%) and female was 12 years (12%). Moreover, 4 years was the lowest proportion in both male (2%) and female (4%). In specific part of body sport injury, the researcher also found that the proportion of fractures progressively increased to ages 6 to 9, then decreased. And then the rate of ligament injuries throughout the age range, however the proportion of head injuries was decreasing with increasing age. The proportion of skin/soft tissue injuries was relatively constant at each age, accounting for a mean of 35% of injuries, but at age 3, however, this proportion was 71%.

**Different Type of the Injuries**

According to Taylor, Attia (2000), the highest rate of injuries were sprains and strains with 217 people (32%) occurred in different sports, then the second highest type of injuries was fractures with 199 people (29%) and the less people suffered injuries was laceration with 64 people (9%). Moreover, based on the literature from Rauh, Macera, Wiksten
(2007) shown that sprains and strains were also the most common type of injuries. The proportion of sprains and strains were 59.7% out of six types of injuries and five different sports. The less type of injuries was fracture with 0.9%. Nevertheless, a literature from Rechel, Yard, Comstock (2008) has found that sprains and strain were also the highest proportion types of sports related injuries in all the sports in research including football (51.5%), soccer (67.3%), basketball (59%), wrestling (43.7%) and baseball (50.6%). Besides, the less proportion type of sport related injuries was concussion. According to Sahlin (1990)

Sprains also has the highest proportion in both 5-11 years old and 12-14 years old children with total 251 cases out of 758 cases. Most of the literature shown sprains and strains were the most common types of sports related injuries.

Summary

Due to the sport activities participation became more popular nowadays in youngsters, this research have responsibilities to identify all the risk factors will influence children suffered injuries. By knowing the risk factors in different age groups, different types of sport,
the equipment, sport arenas, coaching and teacher’s behaviors and children behaviors to have a better outlook to the teachers and coaches to have prediction to the sport related injuries.
CHAPTER 3

METHOD

The method of this study was presented in the following sections: (1) Subjects, (2) Instruments, (3) Procedures, (4) Data Collection and (5) Data Analysis.

Subjects

The selected samples were in both genders, aged between 6 and 18 students, in total 150 subjects, 85 were boy’s subjects and 65 were girl’s subjects. They were divided into primary group, aged 6-12, in total 59 subjects, and secondary group, aged 13-18, in total 91 subjects. They were randomly chosen from five primary schools and five secondary schools in Hong Kong, each of the school was asked to randomly deliver twenty questionnaires to the students.

Instruments

The instruments used in the present study was named “Sport Injuries Reporting Form (H.K. Region)”, originally established by Leung, Fu and Li (1998). Since the pilot
study has been done by 30 university students before, this
well-established questionnaire would be adopted without the
need of translation.

The questionnaire was originally consisted 23 questions
but three of the question, including the name of
organization, the name, phone no. of subjects, had been
deleted in this study because these were not essential to
the study. Therefore, a total of 20 items, including the
demographic information (age, gender) and the injury
information, including the injury sports (34 items, such as
archery, camping, basketball, volleyball and soccer),
diagnosis (31 items, such as head, elbow and hip), occasion
(4 items, such as training, class and competition), source
of diagnosis (4 items, such as bone setter, self and
physicians), primary mechanism (6 items, included overuse,
stretch and torsion), nature of injury (new and recurring),
surface condition (6 items, for example, normal, wet, hard
and irregular), protection of body part ( 4 items, included
taped, bandaged and none), action taken (hospitalized and
non-hospitalized), warm-up adoption were asked in the
questionnaire.
Data Collection Procedures

A pilot test was conducted with 30 students in primary school students, because the previous study did not conduct in primary sector. The purpose of it was to see whether the wordings of the questionnaire were accurate and precise and to test whether the questionnaire was understandable enough. The subjects can state out the problem of the questionnaires. The pilot test was completed and no problem had been resulted. Thus, the questionnaire was hand-distributed to the selected students after their school classes. They need about 8 minutes to complete it so the questionnaires were collected in the classroom. The questionnaire was separately distributed. The data was successfully collected and analyses by the Statistic Package for Social Science (SPSS) in the computer. All questionnaires are confidential and will be destroy after the research is complete.

Data Analysis

The data collected was analyzed by the SPSS version 18.0. All data was tested at the level of significance at 0.05. Descriptive statistics, such as mean, frequency and standard deviation were used to describe the demographic and injury information in percentage (%).
Chi square test was conducted to determine whether there is significant difference in sport injuries frequency between genders and between two age groups.

Chapter 4

ANALYSIS OF DATA

During the half year of study, 150 aged from 6 to 18 primary and secondary school students were recorded as injured. The data was presented in this chapter in two main parts, (1) Results and (2) Discussion and Implication.

Results

The results are presented into the following parts: (1) Demographic data, (2) Descriptive Statistics, (3) The top three injured body parts of the top five most common injured sport and, (4) The top three condition of injuries of the top five most common injured sports, (5) Comparison of different gender in sport injury and (6) Comparison of different age group sport injury

Demographic data

The gender and age group distribution of injuries are showed as following figure1 and figure2. 56.7% recorded
injuries are occurred in boys and 43.3% in girls. The majority of injury cases were occurred in secondary school 13-18 age group in 60.67%.

**Figure 1.** The percentage of the boys and girls students participated in the survey

![Pie chart showing sex distribution](image)

Girls 43.3%
Boys 56.7%

**Figure 2.** Age group distribution participated in the survey

13-18 60.67%
6-12 39.33%
**Descriptive Statistics**

**Most Common Injured Sports**

The survey found that basketball had the most injuries in boys respondents while soccer came second and volleyball and track & field came third. For girls, volleyball had the most injuries while soccer and badminton came to the second and third. Table 1 shows the distribution of injuries by sports in both sex.

**Table 1.** Distribution of injured girls and boys according to type of sports

<table>
<thead>
<tr>
<th>Sports activity</th>
<th>Girls</th>
<th>Boys</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>5</td>
<td>19</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Soccer</td>
<td>9</td>
<td>14</td>
<td>23</td>
<td>15.3</td>
</tr>
<tr>
<td>Volleyball</td>
<td>11</td>
<td>8</td>
<td>19</td>
<td>12.7</td>
</tr>
<tr>
<td>Track and Field</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>7.3</td>
</tr>
<tr>
<td>Badminton</td>
<td>8</td>
<td>1</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Handball</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Cycling</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>Hiking</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Rugby</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Activity</td>
<td>6-12</td>
<td>13-18</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>-------</td>
<td>----</td>
<td>-----</td>
</tr>
<tr>
<td>Long Distance</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Rope Skipping</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Others</td>
<td>8</td>
<td>20</td>
<td>28</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>65</td>
<td>85</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

**Site of Sport Injuries**

Data indicated that ankle injuries were the most common occurred in 13-18 age group students, meanwhile, ankle was as same as knee came to the first occurred injury in 6-12 age group students, total contributed 14% out of all injuries. Shoulder and knee injuries was ranked the second highest with 10.7% and the third highest came from thigh injuries. Lower extremities were the most injuries occurred body part in total 31.4%. the injury site were similar in both age group and sexes. Table 2 shows the distribution of primary and secondary school students in different types of diagnosis.

**Table 2.** Distribution of primary and secondary students in different types of diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>6-12</th>
<th>13-18</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankle</td>
<td>6</td>
<td>15</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>10.7</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Shoulder</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>10.7</td>
</tr>
<tr>
<td>Knee</td>
<td>6</td>
<td>10</td>
<td>16</td>
<td>10.7</td>
</tr>
<tr>
<td>Thigh</td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>6.7</td>
</tr>
<tr>
<td>Face</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Finger</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>4.7</td>
</tr>
<tr>
<td>Elbow</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Forearm</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Wrist</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Calf</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Head</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Upper arm</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Foot</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
<td>20</td>
<td>32</td>
<td>21.3</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>91</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Cause of Injuries**

The majority injuries were caused by direct impact-by-object, followed the second highest rate of the causes were stretch (as shown in figure 3). The implication of this result is that the injuries caused by falling, twists the ankle while landing and hit by the equipment such as balls
and rackets. Moreover, the injuries also caused by the over-
extension of the body and did not have enough warm up before
the sport activities.

**Figure 3.** Distribution of the causes of injury (%)

**Condition of injuries**

Figure 4 showed the rate of nature of injury. Data implied
that sprain came to the first and contusion came to the
second and abrasion were same as strain came to the third
highest of the nature of injury. Sprain contributed 35 cases
(23.33%), contusion 29 cases (19.33%) and abrasion and
strain were 26 cases (17.33%) independently.
Occasion of Injuries

The injuries occasion were mainly occurred in three situations (as shown in figure 5). Training came to the most occurrences (30.67%), and then followed were competition (27.33%) and leisure & recreation (26.67%). Classes (15.33%) came to the less significant can due to the classes have certificated professional and well-trained physical education teachers to guide the children to avoid those sport injuries. The source of diagnosis (shown in figure 6)
responded to the occasion of the injuries. Coaches and teachers (31.33%) with self (31.33%) determine came to the first sources of the diagnosis were because training, competitive and the leisure and recreation had high rate (over 80%) of occasion occurrence. Therefore, for the training and competition, coach and teacher have been the first person to take care the children. Moreover, self determination were the result of some leisure and recreational sport activities.

Figure5. The occasion during which injury occurred
Figure 6. The sources of diagnosis

Warm up situation of injuries

Data showed that 112 respondents (shown in figure 7) (74.6%) had performed warm up before the sport activities. It is similar to the data reported in 1998 that over 80% of the respondents indicated that they did the warm up before they participate to the sport activities.

Figure 7. Performed warm up by participants
The top three injured body parts of the top five most common injured sport

The crosstabs results of the top five common injured sports and injured body parts (as shown in table 3) showed that ankle was the most common injured body parts of basketball (16.7%), soccer (26.1%) and volleyball (31.6%). And face (16.7%) and fingers (12.5%) were the second and third most common injured in basketball. For soccer, groin (13%) injured was the second common. For volleyball, forearm (15.8%) and fingers (10.5%) were the second and third common injured parts. For track and field, the most common injured body parts were knee (27.3%), shoulder (27.3) and thigh (18.2%). For badminton, they were shoulder (33.3%), calf (22.2%) and upperarm (11.1%).

Table 3
Common injured body parts of the common injured sport

<table>
<thead>
<tr>
<th>Sports</th>
<th>Rank 1</th>
<th>%</th>
<th>Rank 2</th>
<th>%</th>
<th>Rank 3</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>Ankle</td>
<td>16.7</td>
<td>Face</td>
<td>16.7</td>
<td>Finger</td>
<td>12.5</td>
</tr>
<tr>
<td>Soccer</td>
<td>Ankle</td>
<td>26.1</td>
<td>Groin</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volleyball</td>
<td>Ankle</td>
<td>31.6</td>
<td>Forearm</td>
<td>15.8</td>
<td>Finger</td>
<td>10.5</td>
</tr>
<tr>
<td>Track &amp; Field</td>
<td>Knee</td>
<td>27.3</td>
<td>Shoulder</td>
<td>27.3</td>
<td>Thigh</td>
<td>18.2</td>
</tr>
<tr>
<td>Badminton</td>
<td>Shoulder</td>
<td>33.3</td>
<td>Calf</td>
<td>22.2</td>
<td>Upperarm</td>
<td>11.1</td>
</tr>
</tbody>
</table>
The top three condition of injuries of the top five most common injured sports

As the results showed in table 4, the most common injured conditions of basketball were contusion(29.2%), sprain(29.2%) and abrasion(16.7%). For soccer, they were contusion(17.4%), fracture(17.4) and sprain(17.4). For volleyball, they were sprain(42.1%), contusion(21.1%) and abrasion(15.8%). For track and field, they were strain(54.5), contusion(18.2%) and abrasion(18.2%). Lastly, for badminton, they were contusion(33.3%), Sprain(33.3%) and Strain(22.2%).

Table 4
Top three condition of injuries of the top five injured sport

<table>
<thead>
<tr>
<th>Sport</th>
<th>Rank 1</th>
<th>%</th>
<th>Rank 2</th>
<th>%</th>
<th>Rank 3</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>Contusion</td>
<td>29.2</td>
<td>Sprain</td>
<td>29.2</td>
<td>Abrasion</td>
<td>16.7</td>
</tr>
<tr>
<td>Soccer</td>
<td>Contusion</td>
<td>17.4</td>
<td>Fracture</td>
<td>17.4</td>
<td>Sprain</td>
<td>17.4</td>
</tr>
<tr>
<td>Volleyball</td>
<td>Sprain</td>
<td>42.1</td>
<td>Contusion</td>
<td>21.1</td>
<td>Abrasion</td>
<td>15.8</td>
</tr>
<tr>
<td>Track&amp;Field</td>
<td>Strain</td>
<td>54.5</td>
<td>Contusion</td>
<td>18.2</td>
<td>Abrasion</td>
<td>18.2</td>
</tr>
<tr>
<td>Badminton</td>
<td>Contusion</td>
<td>33.3</td>
<td>Sprain</td>
<td>33.3</td>
<td>Strain</td>
<td>22.2</td>
</tr>
</tbody>
</table>

Comparison of different genders in the sport injuries
Chi square test was conducted to test the difference between different genders in the sport injuries situation. The results (As shown in table 5) showed that there was no any significant difference on sport injury items among boys and girls.

Table 5

The difference on sport injuries items between genders

<table>
<thead>
<tr>
<th>Injury Items</th>
<th>X²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports</td>
<td>32.941</td>
<td>.133</td>
</tr>
<tr>
<td>Body Parts</td>
<td>23.231</td>
<td>.564</td>
</tr>
<tr>
<td>Condition</td>
<td>5.145</td>
<td>.821</td>
</tr>
<tr>
<td>Occasion</td>
<td>1.025</td>
<td>.795</td>
</tr>
<tr>
<td>Primary Mechanism</td>
<td>2.541</td>
<td>.770</td>
</tr>
<tr>
<td>Nature of Injury</td>
<td>.406</td>
<td>.547</td>
</tr>
<tr>
<td>Warm up adoption</td>
<td>.921</td>
<td>.337</td>
</tr>
</tbody>
</table>

P<0.05, 2 sided

Comparison of different age group in the sport injury

The Chi Square test was used in analysed the difference between different age group in different sport injury related items. As shown in table 6.1, There was only three items had significant difference. They were the adoption of
warm up \((X^2=5.412, \ p=.020)\), injured occasion \((X^2=11.086, \ p=.011)\) and the source of diagnosis \((X^2=9.771, \ p=.044)\).

For the adoption of warm up, the proportion of students aged 13-18(81.1%) performed warm up exercise were more than the students aged 6-12(64.4%). (as shown in table 6.2)

For the occasion of injury, the students who aged 13-18 were more vulnerable to injury in training and competition whereas the students aged 6-12 were more vulnerable in leisure activities. (as shown in table 6.3)

For the source of diagnosis, the students who aged 13-18 tended to have injuries diagnosis by physicians whereas the injuries students aged 6-12 were tend to diagnosis by themselves or teachers. (as shown in table 6.4)

Table 6
The difference on sport injuries items between age group

<table>
<thead>
<tr>
<th>Injury Items</th>
<th>(X^2)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Parts</td>
<td>19.079</td>
<td>.793</td>
</tr>
<tr>
<td>Condition</td>
<td>8.198</td>
<td>.514</td>
</tr>
<tr>
<td>Occasion</td>
<td>11.086</td>
<td>.020</td>
</tr>
<tr>
<td>Primary Mechanism</td>
<td>8.125</td>
<td>.149</td>
</tr>
<tr>
<td>Nature of Injury</td>
<td>.243</td>
<td>.622</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Source of diagnosis</td>
<td>11.086</td>
<td>.011</td>
</tr>
<tr>
<td>Warm up adoption</td>
<td>5.412</td>
<td>.020</td>
</tr>
</tbody>
</table>

P<0.05, 2 sided

**Discussion and Implication**

The results of the present study indicated many meaningful and useful data for understanding the sport injuries situation among Hong Kong school sectors. They would be answer the five research questions and discussed in the following parts: (1) The most common sport injuries, (2) Basketball, (3) Soccer, (4) Volleyball, (5) Research question 2, (6) Research question 3 and the (7) comparison of primary and secondary students in warm up adoption, occasion of injuries and source of diagnosis.

**Research Question 1:**

*What kind of sports is easier lead to injury?*

The most common sport injuries

The top five most common sport injuries in the present study showed that they were basketball, soccer, volleyball, track and field and badminton. These were consistent with previous studies. Babul et al., (2007), O’Rourke et al. (2005) and Rauh et al., (2007) both suggested basketball and soccer were
the most common sport led to injuries. Besides, the result of present study was very similar to the previous study of Leung, Fu and Li in 1998, they agreed the top four sports of this study but disagreed with the last one, badminton whereas it suggested gymnastics as the fifth sports easier led to injuries. It can be explained that gymnastics nowadays is not as popular as before. Fewer students participated in gymnastics because of its high risk. Therefore, the injuries in gymnastics among the students in present study were low compared with the study in 1998.

Basketball

Basketball was the most common sport injuries occurred in students whereas they were more likely took place in the ankle, face and finger. Besides, sprain, contusion and abrasion were the common condition of basketball injuries. These were consistent with some early study, Rauh, Macera and Wiksten (2007) suggested ankle injuries were the highest injuries occurred in basketball and Leung, Fu, and Li (1998) agreed ankle and finger were the most common body parts injured in basketball. The results implied that players should be aware of stepping on other player’s foot or obstacles while landing from a jump, also a suitable basketball shoes would reduce the ankle sprain injuries of landing. Also, players
should pay attention on the ball while playing in order to prevent the ball hit on the face. Proper hand and finger posture when receiving ball can prevent from finger fractures of ball hit on the end of the fingers.

**Soccer**

Soccer came to the second highest injury rate in the present study. Ankle and groin were the most common body parts in soccer injuries which were all in the lower extremities. Sprain, fractures and contusion were the most common condition of injuries. It was similar to the previous study of Leung, Fu and Li (1998), all injury site of soccer was in the lower extremities, especially ankle. It implied that soccer players should be aware of stepping on objects, such as players foot or ball, be aware of different turf’s condition and wear the suitable soccer boot or shoes.

**Volleyball**

Volleyball was the third sports led to sports injuries while it was the most popular sports among girls in injuries. It can be explained that volleyball in Hong Kong is more popular in girls than boys, people in Hong Kong would also viewed volleyball as a girl’s sport. The most common injured body parts were ankle, forearm and finger which was very
similar as the study of Leung, Fu and Li (1998). They agreed that ankle and finger were the most common injured body parts. For the condition of injuries, sprain was the most common in volleyball which was consistent with the study of Rechel, Yard, Dawn Comstock (2008). These implied that players should strap their fingers before playing in prevent fingers fractures.

Research question 2:
Does the P.E. lesson have enough safety guidelines to follow in order to prevent injury?

The results showed that percentage of students injured in P.E. class was 15.33%, which was the least easily occurred sport injuries. Besides, compared with the results of the study in 1998, the injuries occurrence in P.E class had been slightly decreased. It implied that the safety guidelines in P.E. lessons had been improved but still not enough to prevent injuries among students, especially in primary students(23.7%). It is recommended to increase the teaching attention on safety guidelines and knowledge to ensure students are well aware of the risk of particular sports or exercises and the injury prevention techniques.
**Research question 3:**

**Does doing warm-up can prevent sport related injury?**

The results showed that there was over 70% students got injuries although they adopted warm up before physical activities and exercises. Besides, the results showed that stretch (20.67%) and torsion (16.67%) were the most popular cause of injuries, apart from the direct impact-object (34%). It implied that warm-up may not as effective as people think in sport injury prevention since stretch and torsion were supposed can be prevented by warm-up.

**Research question 4:**

**Is there any difference in sport injuries between boys and girls?**

The present study indicated that there was no any significant difference between genders in any items about sport injuries. Also, the gender distribution in this study was quite evenly distributed with boys (56.7) and girls (43.3%). It was inconsistent with some previous studies which they suggested sport injuries were more common in boys than girls (Taylor and Attia (2000), Babul et al., and Garrick and Requa (1978)). It can be explained by the opportunities of girls participating in different sports had been increased and
also the sport advantages on different genders had been limited and decreased. Thus, the evenly sport participation between genders led to similar sport injury situation.

Research question 5:
Is there any difference in sport injury between primary and secondary school student?

The recent study showed that there was significant difference on three aspect of sport injuries between primary and secondary students, which were warm-up adoption, occasion of injury and the source of diagnosis but no significant difference in injured sports, body parts, condition and primary mechanism.

Comparison of primary and secondary student on warm up adoption

The present study showed that there was significant difference between students aged 6-12 and 13-18 on the adoption of warm up. The proportion of students aged 6-12 (35.6%) without adoption of warm up before exercise were more than the students ages 13-18 (18.7%). It implied that the students aged 6-12 had overlooked the importance of warm up in preventing injuries of exercises. In addition, there
still had 25.4% students do sports without warm up. Teachers might need to be caution on teaching students the proper way in doing exercise and instill the importance of warm up especially the primary students, since they are young and without cognitive and analysis abilities which would need to be taught.

Comparison of primary and secondary student on injured occasion

The present study examined that there was significant different on the two age groups on injured occasion. Students aged 13-18 were more vulnerable to injury in training and competition. It can be explained that the opportunities of older students in participating in sport training and competition were much more than younger students. Moreover, the training and competition in older students were more formal and intense, the probabilities to get injuries were higher. It implied that sport coaches should be more understanding and sensitive to the athletes’ physical strength and old injuries and to adjust the training plan if needed. For the younger students, they were more vulnerable in leisure activities. It implied that the
prevention of sport injuries on them was weak outside school. Parents should pay more attention on their children who do exercise in leisure time.

Comparison of primary and secondary student on the source of diagnosis

The study showed that there was also significant difference in the two age groups (aged 6-12, 13-18) on the source of injuries diagnosis. The students who aged 13-18 tended to have injuries diagnosis by physicians whereas the injuries students aged 6-12 were tend to diagnosis by themselves or teachers. It implied that the degree of injuries of older students were more serious than the younger students. The younger students were more likely to have injuries of abrasion and contusion which can be diagnosed by themselves and teachers. It can be explained that the motor skills and the sense of space were still developing that would easily bring them injuries.
CONCLUSION AND RECOMMENDATIONS

This Chapter was divided into two parts, (1) Conclusion and (2) Recommendation for further studies.

Conclusion

The aim of this study was to investigate the sport injuries situation among Hong Kong primary and secondary students. Besides, it aimed to examine different injuries conditions between primary (i.e. aged 6-12) and secondary (i.e. 13-18) students. Moreover, it aimed to discover the body part of injuries, the causes, the time and the occasion that all the factors will lead to injuries. Although figuring out the reason of the sport injuries cannot avoid all of the injuries, I hope this study can help to reduce the sport related injuries as much as we can in the future. The questionnaires were hand distributed and completed by 150 students in both school sectors.

Demographic

This research contains total 150 children who were aged between 6-18 studying in primary (39.33%) and secondary (60.67%) school students. Total included 85 boys and 65 girls.
Findings

1. The most common sport lead to injury found were basketball (16%). Following was soccer (15.3%) and volleyball (12.7%).

2. The most common injury was ankle injuries (16%), followed by shoulder and knee (10.7%).

3. There was no significant difference between boys and girls in any sport injury situation.

4. There were significant different between 6-12 and 13-18 age group students, this research shows that aged 13-18(81.1%) performed warm up exercise were more than the students aged 6-12(64.4%).

5. There was significant difference between students aged 6-12 and 13-18 in the occasion of injured. The students who aged 13-18 were more vulnerable to injury in training and competition whereas the students aged 6-12 were more vulnerable in leisure activities.

6. There was significant difference between the two age group on the sources of diagnosis. The students who aged 13-18 tended to have injuries diagnosis by physicians whereas the injuries students aged 6-12 were tend to diagnosis by themselves or teachers.
Recommendations for further studies

1. Compare with the Hong Kong studying population, this study only contain a small amount of sample size of the Hong Kong students. I suggest the future study can contain bigger sample size such as include the university student in further study to be more reliable to the result.

2. Apart from distributing the questionnaire, I highly recommended that further research can use qualitative research such as interview the patient in order to have more and clear information about the injuries.

3. In many previous studies, they suggested that there was different between genders but inconsistent with the present study. I suggest that further study can focus more about gender how to bring the difference to the injuries.

4. There was no correlation analysis had been done. To investigate the relationship between different sport injuries condition and demographic characteristics, such as the relationship between age and the degree of injury, was recommend to study in the future.

5. This study didn’t focus on the school team and non-school
team difference of the sport injuries, for example, the occasion difference and the degree of the injuries. It should have a great difference on this to have a suitable method to prevent the injury happen.

6. In both of this research and the previous research (1998) indicated that most of the injuries cases have had warm up before they got injuries. It is a good direction for further study that “can warm up prevent or reduce sport related injury happen?” or “what kind of warm up can have better result for prevention for sport related injury”.
References


Rutter, M., Chadwick, O., Shaffer, D. and Brown, G.


「香港學童運動創傷」之研究調查

尊敬的女士/先生：

您好！

本人是香港浸會大學體育學系學士生，現就本人畢業論文之調查研究，懇請您協助填寫本問卷。

本研究的主要目的是瞭解香港學童於課外及課堂上的運動創傷情況。這項研究將有助找出如何減少學童因運動而受傷的機會。

本調查問卷共20條選擇題，約需要10分鐘時間完成。這是一份不記名問卷，您所提供的一切資料會絕對保密，數據僅用於統計分析，故請您盡量表達您的真實感受。

本人深感有關研究給您帶來諸多不便，在此對您的體諒和幫助深表感謝。

衷心感謝並祝您身體健康，生活愉快！

陳健鋒
謹啟
*請圈選適當的答案

1. 年齡 (AGE): ________

2. 性別 (SEX): 男(M) / 女(F) *

3. 受傷日期 (DATE OF INCIDENCE): ________DD/MM/YY

4. 受傷時間 (Time): *
   1. 06:00-12:00   3. 18:00-00:00
   2. 12:00-18:001   4. 00:00-06:00

5. 季候 (Season): *
   1. 球季前 (Preseason)   3. 球季後 (Postseason)
   2. 球季中 (Regular season)   4. 不適用 (Not applicable)

6. 運動項目 (Sports): *
   1. 健康舞 (Aerobic Dance)   11. 劍擊 (Fencing)   21. 欖球 (Rugby)
      (Volleyball)   31. 排球 (Volleyball)
   2. 射箭 (Archery)   12. 曲棍球 (Hockey)   22. 溜冰 (Skating)
      (Water Polo)   32. 水球 (Water Polo)
   3. 羽毛球 (Badminton)   13. 高爾夫球 (Golf)   23. 足球 (Soccer)
      (Training)   33. 器械訓練
   4. 籃球 (Basketball)   14. 體操 (Gymnastic)   24. 跳繩 (Rope Skimming)
      (Weight Training)   25. 排球 (Volleyball)
   5. 保齡球 (Bowling)   15. 手球 (Handball)   26. 游泳 (Squash)
      (Swimming)   34. 滑浪風帆 (Surfing)
   6. 露營 (Camping)   16. 遠足 (Hiking)   27. 網球 (Tennis)
      (Table Tennis)   35. 其他 (Others)
   7. 獨木舟 (Canoeing/Kayaking)   17. 騎術 (Horse Riding)   28. 乒乓球
      (Tennis)   18. 空手道 (Karate)   29. 田徑 (Track and Field)
   9. 單車 (Cycling)   19. 武術 (Martial Art)
10. 舞蹈(Dance) 20. 划艇(Rowing) 30. 彈網(Trampoline)

7. 診斷(Diagnosis): *
受傷部位(Body Part):
1. 頭(Head) 11. 上臂(Upper arm) 21. 下陰(Gonad) 31. 其他(Others):
2. 面(Face) 12. 手肘(Elbow) 22. 盤骨(Hip)
請註明: __________
3. 眼(Eye) 13. 前臂(Forearm) 23. 鼻膝(Groin)
4. 耳(Ear) 14. 手腕(Wrist) 24. 大腿(Thigh)
5. 下顎(Jaw/Chin) 腳踝關節(Knee)
6. 牙齒/嘴(Teeth/Mouth) 15. 手(Hand) 25. 腳(Shin)
7. 鼻(Nose) 16. 手指(Finger) 26. 小腿骨
8. 喉(Throat) 17. 胸部(Chest) 27. 小腿(Calf)
9. 頸(Neck) 18. 上背部(Upper Back) 28. 腳踝(Ankle)
10. 肩膀(Shoulder) 19. 下背部(Lower Back) 29. 腳掌(Foot)
 腳趾(Toe)

受傷情況(Condition) *
1. 瘀傷(Contusion) 5. □ 帶拉傷(Sprain) 9. 燒傷(Burn)
2. 腦震盪(Concussion) 6. 皮膚撕裂(Laceration) 10. 脫位(Dislocation)
3. 擦傷(Abrasion) 7. 抽筋(Cramps) 11. 其他(Others) 請註明______________
4. 骨折(Fracture) 8. 肌肉拉傷(Strain)

8. 受傷肢體 (Extremity) : *
1. 不適用(Not Applicable) 3. 左邊(Left)
2. 右邊(Right) 4. 左邊及右邊(Both)
9. 受傷原因 (Primary mechanism) :*
   1. 不知道(Uknown)                  5. 拉傷(Stretch)
   2. 直接撞擊-人(Direct Impact – Human) 6. 過勞(Overuse)
   3. 直接撞擊-物件(Direct Impact – Object) 7. 其他( Others) 請註明
   4. 扭傷(Tortion)

10. 運動性質 (Occasion) :*
     1. 康樂或休閒活動(Leisure/Recreation)     4. 上課(Class)
     2. 訓練(Training)                        5. 其他( Others) 請註明
     3. 比賽(Competition)

11. 診斷者 (Source of Diagnosis) :*
     1. 醫生(Physicians)                      3. 跌打醫生(Bone setter) 5. 其他
        (Others) 請註明________              2. 自己(Self)        4. 教練/教師(Coach/Teacher)

12. 受傷場地 (Surface Played On) :*
     1. 草地(Grass)                           4. 硬地(Cement)   7. 水(Water)
     2. 人造草地(Artificial Turf)             5. 道青地(Asphalt) 8. 其他
        (Others) 請註明________              3. 木板( Wood)        6. 人造膠地(Synthetic)

13. 場地情況 (Surface Condition) :*
     1. 正常(Normal)                          4. 泥濘(Muddy)  7. 其他
        (Others) 請註明________               2. 潮濕(Wet)       5. 硬(Hard)
     3. 不濕但滑(Slippery, not wet)           6. 不平(Irregular)

14. 受傷性質 (Nature of Injury) :*
     1. 舊患(Recurring)                        2. 新(New)

15. 保護身體之方法 (Protection of Body Part)*
     1. 任何(None)                            3. 用護墊( Braced, Padded)
     2. 用膠布包紮(Taped)                    4. 用繃帶包紮(Bandaged)
5. 其他 (Others): 請註明__________

16. 保護器材之應用 (Use of Protective Equipment - materials)*
   1. 受傷部位 (Injured part) - 有 (Yes) 沒有 (No)
   2. 非受傷部位 (Non-injured part) - 有 (Yes) 沒有 (No)

17. 處理方法 (Action Taken):*
   不需要住院 (Non-Hospitalized) -
   1. 可以立刻繼續活動 (Returned to play immediately)
   2. 不可以立刻繼續活動 (Could not return to play during game)
   3. 2 至 5 日內不可以運動 (Could not resume for 2 – 5 days)
   4. 6 至 10 日內不可以運動 (Could not resume for 6 – 10 days)
   5. 11 至 20 日內不可以運動 (Could not resume for 11 – 20 days)
   6. 多過 20 日不可以運動 (Could not resume for more than 20 days)

   需要住院 (Hospitalized) -
   1. 住院少於 2 日 (Hospitalized for less than 2 days)
   2. 住院 2 至 5 日 (Hospitalized for 2 – 5 days)
   3. 住院 6 至 10 日 (Hospitalized for 6 – 10 days)
   4. 住院 10 日以上 (Hospitalized for more than 10 days)

18. 熱身運動 (Warm up):*
   1. 有 (Yes) 2. 沒有 (No)

19. 受傷發生於開始運動後的 (Minutes after activity has begun):*
   1. 0 – 30 分鐘 (minutes)
   2. 30 – 60 分鐘 (minutes)
   3. 60 – 90 分鐘 (minutes)
   4. 多過 90 分鐘 (minutes)

20. 在過去一個月參與運動的次數 (Sport participation in last month):*
   1. 每星期 0 – 4 小時 (hr/wk)
   2. 每星期 5 – 8 小時 (hr/wk)
   3. 每星期 9 – 12 小時 (hr/wk)
   4. 每星期多過 12 小時 (hr/wk)