Comparison of Children and Youth Taekwondo Injuries Via Sport Medicine Federation Injury Surveillance System in Iran, 2009-2010

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Abstract

The present study purposed to compare the sport injuries of child and youth taekwondo athletes via the data of Sport Medicine Federation Injury Surveillance System of Iran in 2009 and 2010. A retrospective analysis was conducted of the data for children and youth taekwondo athletes presented to the injury surveillance system in two years. Mann-Whitney U test was used with the significance level of $p < 0.05$. In two years of 2009-2010, from 2026 injured children and youth athletes, 2258 injuries were reported. There was a significant difference between children and youth injuries ($p = 0.002$). Boys’ and girls’ ($p = 0.012$), and men’s and women’s ($p = 0.001$) injuries were significantly different. Children, especially boys (49.3%), incurred most of injuries in upper extremity. Wrist in children and knee in youth were the most common body parts injured. As a result, youth sustained significantly more injuries than children. Level of activity, more intense training and competition and increased body weight and strength in youth may make them more susceptible to injury relative to children. In conclusion, upper extremity in children and lower extremity in youth need to be in priority of preventive measures.

Keywords: Sport Injury, Taekwondo, Children, Youth, Surveillance System.

1. Introduction

Taekwondo is a modern sport and is one of the most popular martial arts with more than 80 million practitioners worldwide (Kordi & Maffulli, 2009). Taekwondo engages many ages. Due to its nature of contact, taekwondo contains many injuries. As participation increases, the safety becomes more important. Children and youth are of very important ages engage in taekwondo. Some studies compared the youth and adult injuries (Beis, Tsaklis, Pieter, & Abatzides, 2001). There are always differences between injuries incurred by various ages due to their skill level and experience and some other factors (Pieter & Zemper, 1997). There may be

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differences in injury location, injury type and mechanism as well. For instance, it has been observed that accidental injuries decreased with age. Additionally, the oldest athletes showed a high percentage of sprains and strains relative to younger athletes (Myer, Quatman, Khoury, Wall, & Hewett, 2009). Weight differences can be another factor affecting injury incidence in youth and adults (Beis, Pieter, & Abatzides, 2007). Thus, the injury incidence rate can alter between youth and adults due to their different characteristics. According to this issue and the lack of studies comparing injuries among child and youth taekwondo participants, the present study purposed to compare the injuries of child and youth taekwondo athletes via the data of sport medicine federation injury surveillance system of Iran in 2009 and 2010.

2. Methods

2.1. Participants

A retrospective analysis was conducted of the children’s data and youth taekwondo athletes from the sport medicine federation injury surveillance system of Iran.

2.2. Procedure

The present study was a descriptive-comparative study. The sport medicine federation injury surveillance system is operated to provide sport related injuries incurred by insured athletes participating in various sports from all provinces of Iran. All insured athletes injured should present to the Sport Medicine Federation in order to be referred to the hospital for treatment. Age and gender were investigated during the analysis. Data were divided into 2 age groups: 7 to 14 years and 15 to 24 years.

2.3. Statistical analysis

In order to compare groups, Mann-Whitney U test was used with the significance level of \( p < 0.05 \). All statistical analysis was done by SPSS software (Version 14).

3. Results

In two years of 2009-2010, from 2026 injured children and youth athletes (mean age = 16.16± 4.037), 2258 injuries were recorded. As the results showed, there was a significant difference between children and youth injuries \( (p = 0.002) \). Boys’ and girls’ \( (p = 0.012) \), and men’s and women’s \( (p = 0.001) \) injuries were significantly different (Table 1).

Table 1. The difference of taekwondo injuries by age and gender in children and youth.

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>Mean ranks</th>
<th>Z</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age level</td>
<td>Children</td>
<td>1072.85</td>
<td>-3.071</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Youth</td>
<td>1159.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>385.67</td>
<td>-2.516</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>436.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>Male</td>
<td>709.85</td>
<td>-3.666</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>799.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As observed in the figure 1, children, especially boys (49.3%) incurred most of injuries in upper extremity. It is noticeable that the difference of upper (57 injuries) and lower (65 injuries) extremity injuries in girls was 8 injuries. However, the most common body region injured was lower extremity in both genders of youth. In addition, the most common body parts in boys (7-14 years) were wrist (15.2%), forearm (14.1%) and knee (8.2%). In girls were wrist (19.6%), knee (15.7%) and ankle (11.8%). In men (15-24 years) were knee (19.2%), ankle (10.5%) and wrist (10%). In women were knee (15.7%), ankle (11.8%) and wrist (9.4%).

4. Discussion

The present study aimed to compare the Iranian children and youth taekwondo athletes’ injuries by the data of the sport medicine federation surveillance system. As results showed, within age categories, youth sustained significantly more injuries than children. It was supported by previews studies that observed men are at a higher risk of injury in comparison to boys, and women are at a greater risk than girls (Schiff, Harmer, Caine, & Commission, 2009). It may be due in part to the levels of activity, the more frequent and severe training and competition of youth may provide conditions that make them susceptible (Caine & Maffulli, 2005). It should not be ignored that injuries may increase with getting older. Because the athletes may increase in the weight of body and strength (Pieter & Zemper, 1997). As not expected, children sustained most of injuries in upper extremity. It may be due to their lower skill in defending kicks (Pieter & Zemper, 1997). However, lower extremity was the most common body region in youth which was consistence with previews studies (Yard, Knox, Smith, & Comstock, 2007). Additionally, men’s and women’s injuries were significantly different in both children and young taekwondo athletes. It was inconsistent with the other nations (Pieter & Zemper, 1997). The reason may be due to the data collection methods or the difference in injury introduction, because the study of Pieter et al. (1997) was a prospective study, while the present study was a retrospective study with a wide range of population. Heavier weight produces greater forces, which are absorbed through soft tissue and joints (Caine, Maffulli, & Caine, 2008). As mostly observed, men are heavier than women. Thus, men may be more susceptible to injury than women. Upper extremity injuries were more in boys (49.3%); however, girls (42.5%), men (42.6%) and women (53.7%) injured more frequently in lower extremity. As observed in results, the most frequently injured body part was wrist – boys (15.2%) and girls (19.6%) - in children. American children incurred most of injuries in the lower leg/foot/ankle (31.8%), followed by the hand/wrist (22.5%) (Yard et al., 2007). Knee, ankle and wrist were three most common body parts injured respectively in both youth genders. This is not surprising, because the lower limb is the primary striking weapon in taekwondo. Children have lower skill in defending kicks, this may expose them to injury more in upper extremity (Pieter & Zemper, 1997), especially wrist and
forearm. From the present study researcher’s view, this is likely due in part to the increased usage of hand by children. However, youth can involve lower extremity more due to the possessions of more skills and experience. Likewise youth are more skillful and it make them to generate heavier force than children (Kazemi et al., 2009), which can lead to knee and ankle injuries.

Conclusion

As seen in the present study, youth sustained significantly more injuries than children, it can be justified by their levels of activity, more intense training and competition and increased body weight and strength in youth. Children incurred most of injuries in upper extremity. While lower extremity was the most common body region injured in youth. Men’s and women’s injuries were significantly different in both children and youth likely due in part to greater forces generated by men. Finally, wrist and knee were the body parts more susceptible to injury in children and youth respectively. As a result, youth are more susceptible to injury in taekwondo, thus they should be paid attention more and in priority of preventive program and measures.

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References