

A PROFILE OF INJURIES IN COLLEGIATE TAEKWONDO KYORUGI ATHLETES

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ABSTRACT

The purpose of this study is to evaluate the common injuries of collegiate Taekwondo Kyorugi athletes in the Philippines. A total of 70 collegiate Taekwondo Kyorugi athletes participated in the study. There were a total of 342 injuries reported with a 100% incidence of at least one injury among the athletes. The most frequently reported injury types are sprains (30%), inflammation (18%) and strains (9%) while injuries most commonly occurred in the ankles (18%), hands (12%), feet (12%) and knees (10%). The high risk for injury is consistent with related studies on injuries in combat sports in general. The trend in type of injury and anatomical regions at risk is also similar to other studies specifically on Taekwondo injuries. As is common in combat sports, Taekwondo carries an inherently high risk of injury but this risk can be managed with proper coaching and sufficient protective equipment.

Keywords: Injuries, collegiate athletes, taekwondo, Kyorugi.

1. INTRODUCTION

Sports injuries can result from acute trauma or repetitive stress associated with athletic activities mostly due to accidents, poor training technique, inadequate equipment, and overuse (Elmagd, 2016). Injury is a major cause for dropout in sports (Gould, 1987) and the repeated bodily stress affects the quality of participation in both recreational and professional athletes (Svoboda & Vanek, 1982). Sports and exercise participation oftentimes carries an inherent risk of injury but this risk is more pronounced in combat sports. Since Taekwondo was included as a medal sport in the 2000 Summer Olympic games, participation in various levels has increased to around 80 million worldwide (Pieter, Fife, & O'Sullivan, 2012). There are two main types of Taekwondo competition – Poomsae and Kyorugi. Poomsae is non-contact and focuses more on forms with defined patterns of execution. Kyorugi, on other hand, is a full-contact type of Taekwondo competition that focuses on sparring.

It has been observed that combat sports that involve striking such as Taekwondo have greater injury incidence (Kazemi & Pieter, 2004) than combat sports that involve only grappling such as Judo and Wrestling (Jarret, Orwin, & Dick, 1998). Cynarski and Kudlacz (2008) observed an 88.9% incidence of serious injuries in Kickboxing, Judo, Jiu Jitsu and Karate competitors' careers even when excluding minor injuries. This observation included a 21% occurrence of broken bones and 16% damage to knee ligaments. Dislocation and injuries to the neck, shoulders and elbows were found to be more frequent in non-striking styles while injuries to the wrists and hands were found to be more frequent in striking styles. Furthermore, sprains, strains, bruises and injuries to the lower limbs were very common in both groups. The risk of injury in combat sports

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like Taekwondo, Karate and Aikido seems to be less in beginner to intermediate level practitioners while more advanced practitioners are twice as likely to get injured (Zetaruk, Violán, Zurakowski, & Micheli, 2005).

In Taekwondo, 18% of injuries have been observed to occur on the feet mostly in the form of contusions, dislocations or fractures (Burks & Satterfield, 1998). Many Taekwondo injuries on the feet occur due to stresses during kicks and jumps (Shamus & Shamus, 2001). Aside from the foot, the knee is also at risk due to increased mechanical overload in sports with lots of jumping and landing (Kezunović, 2013). Knee traumas in Taekwondo are predominantly soft-tissue in nature since it is prone to both accidental and intentional violent contact (Burke, Barfoot, Bryant, Schneider, Kim, & Levin, 2003). In a retrospective longitudinal study on Taekwondo injuries by (Kazemi, Chudolinski, Turgeon, Simon, Ho, & Coombe, 2009), the three most commonly injured anatomical regions were the head (19%), feet (16%) and thighs (9%) while the most common types of injuries were contusions (36%), sprains (19%) and strains (15%). The most common causes of injury were from defensive kicks (44%) and offensive kicks (35%). In elite South Korean Taekwondo athletes, an average of 4.6 injuries per athlete per year was observed (Park & Song, 2017). Most injuries occurred in the lower extremities (65.5%), the trunk (16%), upper extremities (14%) and the head and neck area (4%). The more random and violent nature of sparring compared to non-contact drills or sessions present a greater risk to injury. As such, a common scenario of Taekwondo injury is a kick to the lateral aspect of the knee which may result in a fracture of the proximal fibula, contusion of the shin, or sprain to the knee joint (Birrer, 1996).

Limited information is available on the common injuries of Filipino athletes in general (Duco, 2005; Reyes, 2005; Valleser & Narvasa, 2017) and in combat sports in particular (Maciejewski & Callanta, 2016; Maciejewski & Pietkiewicz, 2016; Valleser, 2016; Lariosa, Gozdowski, Pietkiewicz, & Maciejewski, 2017). In the Philippines, the University Athletic Association of the Philippines (UAAP) arguably features the best collegiate Taekwondo athletes in the country but no study as of yet has observed their common injuries. Thus, the purpose of this study is to determine the common injuries of collegiate Taekwondo Kyorugi athletes in the Philippines. Specifically, the study aims to determine the incidence rate, common injury types, and anatomical regions at risk through a retrospective injury inventory.

2. METHODS AND MATERIALS

2.1 Subjects

The subjects were selected through convenience sampling. The criteria for the selection of research participants were as follows: (1) a current Taekwondo Kyorugi athlete for a UAAP university in at least one year, (2) must have competed in the least UAAP tournament, and (3) must be an active member of the upcoming UAAP season's roster. A total of 70 collegiate Taekwondo Kyorugi athletes ($M_{\text{age}} 19 \pm 2.5$ years) representing 65% of the target population participated in the study.

2.2 Procedure

Data was obtained through a survey questionnaire and guided interviews using a sports injury questionnaire adapted from Duco (2005) and Reyes (2005). The injury profile is divided into 20 anatomical regions with nine (9) types of injuries. For content validity, the instrument has been reviewed by a medical professional in a sports physical therapy clinic and was verified to meet the specific objectives of the study. After obtaining the subjects' informed consent, responses were gathered in their respective training venues. A brief overview about the specific objectives and procedure was given to all participants prior to data collection.

There are a number of limitations to consider in this study. The main limitation is the small sample size and therefore the results may not be widely conclusive to the general population. Another limitation is the nature of retrospective data which is affected by the subjects' ability to accurately recall past injuries. The authors attempted to minimize this limitation and thus the subjects were asked to recall injuries incurred only in the past competitive season (the last 12 months).

2.3 Statistical Analysis

Data was analyzed via descriptive statistics and presented in frequency and percentage distribution tables. Demographic data is presented in means and standard deviation.

3. RESULTS

3.1 Type of Injury: There were a total of 342 injuries reported with a 100% incidence of at least one injury among the athletes, an average of 4.9 injuries per athlete. The main observation is that the most frequently reported injuries were sprains (30%), inflammation (18%) and strains (9%). All other injuries were reported at an occurrence of 7% or less. Table 1 below summarizes the frequency and percentage distribution of all reported injuries.

Table 1: Frequency and percentage distribution of type of injury

Type of injury	Frequency	%
Sprain	104	30
Inflammation	60	18
Strain	32	9
Crushing	25	7
Stress Fracture	25	7
Contusion	20	6
Abrasion	19	6
Dislocation	17	5
Tendinitis	17	5
Fracture	14	4
Others	9	3
Total		100%

Of the reported injuries, sprains were the most common and of these, majority were on the ankles (52%) but also in the knees (13%), wrists (8%) and hands (8%). Below, table 2 presents the percentage distribution of the occurrence of sprains.

Table 2: Percentage distribution of the occurrence of sprains

Anatomical region	%
Ankles	52
Knees	13
Wrists	8
Hands	8
Feet	7
Other	12
Total	100%

The second most common injury were inflammations which make up 18% of all reported injuries. Inflammations were mostly reported in the feet (20%), knees (18%), hands (13%) and shin-calves

(10%). The percentage distribution of the occurrence of inflammations can be seen in table 3 below.

Table 3: Percentage distribution of the occurrence of inflammations

Anatomical region	%
Feet	20
Knees	18
Hands	13
Shin-Calves	10
Arms	8
Groin	7
Elbows	5
Shoulders	3
Wrists	3
Toes	3
Others	10
Total	100%

Strains are the third most common injury. These, however, make up just nine percent of all reported injuries. Strains were most commonly experienced in the thighs (59%), groin (13%) and lower back (13%). Table 4 below displays the occurrence of strains as reported.

Table 4: Percentage distribution of the occurrence of strains

Anatomical region	%
Thighs	59
Groin	13
Lower Back	13
Others	15
Total	100%

3.2 Anatomical Region: As for the anatomical regions at risk, injuries most commonly occurred in the ankles (18%), hands (12%), feet (12%) and knees (10%). All other injury sites were reported to be injured at a rate of nine percent or less. Table 5 below shows the frequency and percentage distribution of injuries by anatomical region.

Table 5: Frequency and percentage distribution of injuries by anatomical region

Anatomical region	Frequency	%
Ankles	60	18
Hands	41	12
Feet	41	12
Knees	34	10
Thighs	30	9
Wrists	23	7
Arms	21	6
Shin-Calves	20	6
Shoulder	15	4
Toes	11	3
Lower Back	9	3
Elbows	8	2
Groin	8	2
Head/Face	7	2
Forearms	4	1
Others	10	3
Total	658	100%

The ankles were the most commonly injured anatomical region with the majority incurred as sprains (90%) and a few as strains (3%) and tendinitis (3%). The hands and feet are the second most injured anatomical regions. Injuries on the hands were mostly sprains (20%), inflammation (20%), dislocations (19%) and fractures (17%). Injuries on the feet were mostly stress fractures (29%), inflammation (29%) and sprains (17%). Knee injuries were mostly sprains (41%) and inflammation (32%). All other anatomical regions are reported to be less frequently injured (9% or less) and represent a much smaller portion of the overall data.

4. DISCUSSION

There was a 100% chance of incurring an injury in the 12 months covered in the retrospective data with an average of 4.9 injuries per athlete. The high risk for injury is consistent with related studies (Kazemi & Pieter, 2004; Cynarski & Kudlacz, 2008) on injuries in combat sports, especially in a style that involves striking. The rate of 4.9 injuries is also very similar to elite South Korean Taekwondo athletes who experienced 4.6 injuries per year (Park & Song, 2017). The high incidence rate is also suggestive of previously observed findings wherein advanced level practitioners, in this case competitive collegiate athletes, are at greater risk of injury compared to beginner and intermediate level practitioners (Zetaruk et al., 2005).

Most of the injuries were incurred at the ankles and feet area which combined for 30% of all anatomical regions reported to be injured. The concentration of many injuries in this area is also similar to previous research findings (Burks & Satterfield, 1998) most probably due to repeated kicks and jumps in both offensive and defensive techniques (Shamus & Shamus, 2001). Another anatomical region at risk were the knees which experienced 10% of all reported injuries. Knee injuries were mostly sprains and inflammation (combined 73% of knee injuries) and this result is also similar to previous studies (Burke et al., 2003). The hands, the second most injured region, were also prone to injury incurring mostly sprains, inflammation, dislocations and fractures (76% of all hand injuries). The violent nature of hand injuries is most probably due to defensive actions by blocking an opponent's kicks as the hands are very rarely used for offensive techniques in Taekwondo.

An interesting observation is the very low occurrence of head injuries (2%) even though one might expect that the head would be a common target. Head trauma is a serious health concern in many combat sports like boxing and mixed martial arts (Seifert, 2017) but this risk is apparently low in Taekwondo as also reported by Park and Song (2017). The low incidence of head injuries may be due to the protective headgear used in Taekwondo competition or because the body is a more common target since it is larger and thus easier to score on. However, this inference is not confirmed.

5. CONCLUSION

The high incidence rate of injuries in Taekwondo Kyorugi participation is consistent across various related literature and practitioners should be aware of this risk especially in high level training and competition. To manage the risk of injury, strength and conditioning programs are recommended to focus on the lower extremities especially on the feet, ankles and knees. Lower extremities suffer the most injuries in Taekwondo and this should be mitigated by better protective gear. However, finding a good balance between the protection ability and non-restriction of movement of lower extremity protective equipment may be a challenge. Protective gear for the head seems to be very effective as is evident in the low incidence of head injuries across different studies. However, protective gear for the hands seem to be insufficient thus far since the hands incur injuries at a relatively high rate.

Even with the apparent high risk for injury, the fact that the participants were all able to compete suggests that the injuries were all manageable within the time frame. As is common in combat sports, Taekwondo carries an inherently high risk of injuries but this risk can be managed with proper coaching and sufficient protective equipment.

6. REFERENCES

- Birrer, R.B. (1996). Trauma epidemiology in the martial arts: the results of an eighteen-year international survey. *American Journal of Sports Medicine*, 24(6), S72-79.
- Burke, D.T., Barfoot, K., Bryant, S., Schneider, J.C., Kim, H.J., & Levin, G. (2003). Effect of implementation of safety measures in taekwondo competition. *British Journal of Sports Medicine*, 37(5), 401-404.
- Burks, J.B., & Satterfield, K. (1998). Foot and ankle injuries among martial artists: Results from a survey. *Journal of the American Podiatric Medical Association*, 88(6), 268-278.
- Cynarski, W., & Kudacz, M. (2008). Injuries in martial arts and combat sports - a comparative study. *Archives of Budo*, 4, 91-97.
- Duco, L. (2005). Injuries among elite and non-elite Filipino gymnasts, (Unpublished undergraduate thesis, University of the Philippines Diliman) Department of Sports Science in the College of Human Kinetics of University of the Philippines Diliman, Quezon City, Philippines.
- Elmagd, M.A. (2016). Common Sports Injuries. *International Journal of Physical Education, Sports and Health*, 3(5), 142-148.
- Gould, D. (1987). Understanding attrition in children's sport. In *Advances in pediatric sport sciences: Behavioral issues* (vol. 2). Eds. Gould, D. & Weiss, M.R. Champaign, IL, USA: Human Kinetics.
- Jarret, G.J., Orwin, J.F., & Dick, R.W. (1998). Injuries in collegiate wrestling. *American Journal of Sports Medicine*, 26, 674-680.
- Kazemi, M., Chudolinski, A., Turgeon, M., Simon, A., Ho, E., & Coombe, L. (2009). Nine year longitudinal retrospective study of taekwondo injuries. *The Journal of the Canadian Chiropractic Association*, 53(4), 272-281.
- Kazemi, M., & Pieter, W. (2004). Injuries at the Canadian national taekwondo championships: A prospective study. *BMC Musculoskeletal Disorders*, 5, 22.
- Kezunović, M. (2013). Overuse knee injuries in athletes. *Montenegrin Journal of Sports Science and Medicine*, 2(1), 29-32.
- Lariosa, C.J.D., Gozdowski, D., Pietkiewicz, S., & Maciejewski, R. (2017). Survey of judo injuries in physical education classes: a retrospective analysis. *Journal of Physical Education and Sport* 17(3), 2034-2042.
- Maciejewski, R., & Callanta, H. (2016). Injuries and training variables in Filipino judo athletes. *Biomedical Human Kinetics*, 8, 165-172.
- Maciejewski, R., & Pietkiewicz, S. (2016). Epidemiology of judo injuries in senior and junior judoka. *Scientific Review of Physical Culture*, 6(3), 27-36.
- Park, K.J., & Song, B.S. (2017). Injuries in female and male elite taekwondo athletes: a 10-year prospective, epidemiological study of 1466 injuries sustained during 250 000 training hours. *British Journal of Sports Medicine*, 52(11), 735-740.
- Pieter, W., Fife, G.P., O'Sullivan, D.M. (2012). Competition injuries in taekwondo: a literature review and suggestions for prevention and surveillance. *British Journal of Sports Medicine*, 46(7), 485-491.
- Reyes, M. (2005). Injuries common to recreational badminton players, (Unpublished undergraduate thesis, University of the Philippines Diliman) Department of Sports

- Science in the College of Human Kinetics of University of the Philippines Diliman, Quezon City, Philippines.
- Shamus, E., & Shamus, J. (2001). *Sports injury: Prevention and rehabilitation*. NY, USA: McGraw-Hill.
- Seifert, T. (2017). Neurologic health in combat sports. *Neurologic Clinics* 35(3), 523-535.
- Svoboda, B. & Vanek, M. (1982). Retirement from high level competition. In T. Orlick, J.T. Partington, & J.H. Salmela (Eds.), *Proceedings of the 5th World Congress of Sport Psychology* (pp. 166-175). Ottawa, ON: Coaching Association of Canada.
- Valleser, C.W.M. (2016). Common injuries of recreational jiu Jitsu. *Journal of Physical Education Research*, 3(4), 52-63.
- Valleser, C.W.M., & Narvasa, K.E.L. (2017). Common injuries of collegiate tennis players. *Montenegrin Journal of Sports Science and Medicine*, 6(2), 43-47.
- Zetaruk, M.N., Violán, M.A., Zurakowski, D., & Micheli, L.J. (2005). Injuries in martial arts: a comparison of five styles. *British Journal of Sports Medicine*, 39(1), 29-33.