Research Report

Injuries of University of Santo Tomas college teams during the UAAP season 70

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ABSTRACT

Background: Sport is an activity governed by sets of rules and customs usually played competitively. Winning or losing from this activity is determined by the physical capabilities of the athletes. In the Philippines, college students from eight different universities and schools in the country compete in the University Athletic Association of the Philippines (UAAP) Season 70. ***Objectives:*** To identify the most common injuries of the University of Santo Tomas (UST) student-athletes in UAAP 70 and to identify the most common body areas injured. It also aimed to determine changes in the most prevalent injury and relative risk of injury of UST-College Teams in UAAP Season 69 compared to UAAP Season 70. ***Methodology:*** A descriptive study of the injuries sustained by the UST college teams participating in the UAAP Season 70 was done. The Center for Research on Movement Science (CRMS) of the Tomas Aquinas Research Complex (TARC) of UST approved the study. All players of the different teams gave their consent to be monitored. A total of eleven (11) UAAP Sports was monitored by the UST-CRS licensed physical therapists. The Australian Sports Injury Data Dictionary was revised and reviewed by the monitoring team composed of licensed physical therapists. They recorded information on the following: type of injury, injured body region, nature and cause of injury, use of protective garment or equipment, contributing factors to injury and the initial treatment given. ***Results:*** A total of 101 injuries were reported for all 11 monitored events of the UST teams in the 70th UAAP season. The most commonly injured body part was the lower leg (26.73%), followed by the thigh (20.79%) and the knee (13.21%). The most common injury was cramps (38%) followed by bruise/contusion/laceration (23.81%). The knee (17%) and lower leg (15%) were the most common sites of injury in UAAP 69. Cramps were still the most prevalent injury in UAAP 70 as it was in UAAP 69.***Conclusion:*** There is a difference in the risk of injury depending on the sports being played. The relative risk of injury is considerably higher in junior basketball (0.92), women's volleyball (0.60), men's baseball (0.47), men's basketball (0.47) and men's soccer (0.44). Primary prevention through health promotion and education in injury prevention must be disseminated in all sports. Basketball still had the highest relative risk of injury in UAAP 69 and UAAP 70.

INTRODUCTION

The University Athletics Association of the Philippines (UAAP 70) started on September 27, 1938. Basketball, women's volleyball, baseball, football, swimming and track and field were among the first sports events. It was in the of 1924 when Dr. Regino Ylanan, the Physical Education Director of the University of the Philippines, saw the need to lay down athletic policies among tertiary institutions. The UAAP aims to foster friendship and sportsmanship among the student-athletes involved in its games. The well conducted games played by talented athletes have attracted interest from national sports association. Outstanding athletes have been invited to join in national and international competitions.[1]

The 2007-2008 UAAP Season 70 was hosted by the University of Santo Tomas in July 7, 2007 at the Araneta Coliseum. It was also at this time that the De La Salle University-Manila's Green and Lady Archers and De La Salle-Santiago Zobel School's Junior Green Archers returned after a season long suspension in UAAP 69. Its theme was "Winners All, Recreating the Value of Honesty through Sports." There were 11 sporting

events in UAAP Season 70 monitored by the UST-CRMS research group. These sports were joined by eight competing universities which were University of Santo Tomas, Far Eastern University, University of the Philippines, La Salle University, Ateneo de Manila University, University of the East, Adamson University and National University.

The UAAP sport events are activities governed by a set of rules or customs and are often engaged in competitively. The physical capabilities of the competitor are the sole or primary determinant in winning or losing. There are studies pointing to the beneficial effect of sports. Granados et al (2008) found significant increases in anthropometric characteristics, physical fitness and throwing velocity of sixteen elite female handball players.[2] Kohrt et al (2004) concluded that weight bearing physical activity has beneficial effects on bone health across age spectrum.

Physical activities that generate relatively high-intensity loading force such as plyometrics, gymnastics and high intensity resistance training, augment bone mineral accrual in children and adolescents.[3] Boreham et al (2004) found out that sports-related physical activities were favorably (i.e. inversely) associated with arterial stiffness. They also found out that cardiorespiratory fitness was inversely associated with arterial stiffness.[4] Steptoe and Butler (1996) found a positive association between emotional well being with extent of participation in sport and vigorous recreational activity among adolescents.[5]

The benefits of engaging in sports brought increasing number of universities competing in the sports of UAAP. From three universities (NU, UP, and UST)[1] in 1931, eight universities joined the in UAAP Season 70. Due to the increasing number of participating universities, researchers of the Center for Research on Movement Sciences of the University of Santo Tomas planned to monitor trends of injury in the UAAP.

There is only one published local research on incidence of injury in UAAP athletes[6] which was pioneered by the CRMS Core Group Researchers in 2007. It is likely that injuries incurred at the student level of participation differ from those for elite and professional players[7]. It is important therefore to understand the incidence and nature of sports injuries at their level. This can assist in the development and implementation of health strategies for sports injury prevention among UST-UAAP players. In the study that the researchers of the UST-CRMS conducted in 2007 for UAAP Season 69 conducted, cramps were the most common injuries incurred by players. The risk of injuries was considerably higher in soccer in team sports and judo in individual sports.

This is a follow-up study purporting to identify the most common injury incurred by the athletes of the University of Santo Tomas College Teams and the body areas commonly affected. Furthermore, this study aims to compare injury incidence and relative risk among UST-College Teams in UAAP Season 69 and UAAP Season 70.

METHODOLOGY

This is a cohort study of the injuries of the UST college teams who participated in the UAAP Season 70. Semi-contact sports comprised of the Taekwondo, Men and Women's Soccer Teams. Light contact sports included men, women and junior's basketball, women's volleyball, softball and baseball. Non-contact sports constituted table tennis and athletics. All players of the different teams gave their consent to be monitored during competitions. The Center for Research on Movement Science (CRMS) of the Tomas Aquinas Research Complex (TARC) granted ethical approval to conduct the study.

Development of the Injury Monitoring Sheet

The Australian Sport Injury Report Form[8], which was adapted from the Sports Medicine of Australia, was revised by the principal investigator to ensure suitability to this study. A group of eleven licensed physical therapists, who work as professors of the UST-CRS, determined the appropriateness of the injury monitoring sheet to the UAAP games. Information which included age, height, weight and playing position were included. A 3-page injury monitoring form was approved and recommended by the group. After pilot-testing the injury monitoring form in 2 competitions, and following a focus group discussion among the assessors, the monitoring sheet was summarized to a 1-page injury form for conciseness and ease of use.

The single-page data sheet recorded information on the following: type of activity at the time of injury, specific injured body area as depicted on a body chart, nature and cause of injury including

the exact mechanism, use of protective garment or equipment, contributing factors to injury, initial treatment given, as well as the health care practitioner (physician or physical therapist) who administered treatment.

After the final revision of the injury monitoring sheet, the eleven licensed physical therapy professors of UST-CRS were oriented on how to document injuries. They were then assigned to monitor the competitions participated in by UST Teams, as determined by the official schedule obtained from the UST Institute of Physical Education and Athletics. (Figure 1).

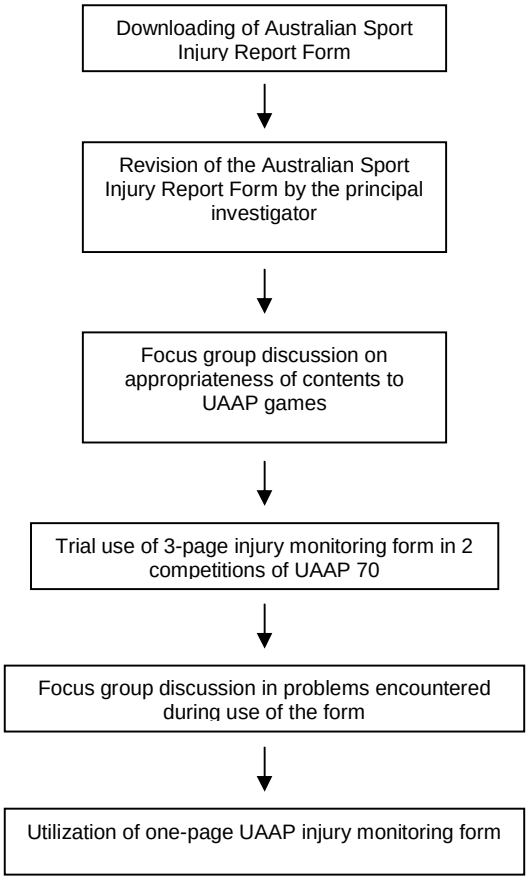

Figure 1: The Development of the UAAP Season 70 Injury Monitoring Sheet

Injury Monitoring

An injury was defined in this study as any physical complaint incurred in an actual competition which received medical attentionfrom the team physician or physical therapist. Once an injury is sustained and appropriate interventions have been given, the researcher-physical therapist assigned to monitor the competition accomplished the injury form as soon as possible to ensure accuracy of data recording. After every competition, data were encoded using Microsoft Excel. Data were analyzed using frequency tables.

Data Analysis

The following statistical procedures were used in this study:

1. Temporal Frequency was used to indicate the occurrence of injuries for each sport event during the UAAP Season 70.
2. Percentage to demonstrate how frequent a certain injury occurred compared to other injuries.
3. Relative Risk of injury was used to determine the most likely sport leading to injury among the 11 sporting events in the UAAP, classified per category (semi-contact, light-contact, and non-contact sports).

RESULTS

Frequency of Injuries in Eleven Sporting Events

A summary of the injuries incurred by UST UAAP athletes in the 70th UAAP Season is shown in Table 1.

BASKETBALL

JUNIOR'S DIVISION

There were 28 episodes of injuries among 11 injured athletes. Most of the injuries were incurred in the 4th quarter (54%) followed by the 3rd quarter (32%). Nineteen out of the 28 injuries (68%) were secondary to cramps, mostly of the gastrocnemius and quadriceps muscles. Most cramps (68%) happened in the 4th quarter while athletes were playing in a very humid environment. Running and landing after a lay-up or rebound were common triggers for cramps. All athletes who suffered from cramps received initial intervention from the physical therapist-in-charge. Four athletes were unable to return to play secondary to unrelenting muscle spasm of multiple muscle groups. Bruises and contusions, which were sudden and non-intentional, were the second most common form of injuries, and affected the knee, shin, hip, and upper incisors. Sixty percent (60%) of the bruises and contusions were attended by the sports scientist on site and did not require attention from the physical therapist-in-charge. Ice was most frequently used as initial treatment followed by stretching, rest, massage, and medicines.

Table 1. **Frequency of Injuries Monitored in Eleven Sports Events Participated in by the University of Santo Tomas in the 70th UAAP Season**

Tournament	Men's Basketball	Women's Basketball	Junior's Basketball	Women's Volleyball	Men's Soccer	Women's Soccer	Athletics	Baseball Men's Division	Taekwondo	Softball	Lawn Tennis
No. of players	15	17	12	15	18	22	15	17	32	15	19
No. of injured players	7	6	11	9	8	8	3	8	2	1	3
No. of injuries	14	10	28	11	10	9	3	9	2	1	5
Injured body part											
Head, neck	2	1	1	0	2	3	0	1	0	0	0
Trunk	0	0	1	0	0	3	1	1	1	0	0
Shoulder	0	0	0	1	0	0	0	1	0	0	1
Arm, upper/lower	0	0	0	0	0	0	0	2	0	0	0
Elbow	1	1	0	0	1	0	0	0	0	0	0
Hand, including wrist, finger	1	0	0	0	0	0	0	1	0	0	0
Hip/groin	3	0	1	0	1	1	0	0	0	0	0
Thigh	4	0	9	3	2	1	0	1	0	0	1
Knee	3	0	6	3	0	0	0	1	0	1	0
Lower leg	3	3	10	2	4	0	2	1	1	0	1
Ankle	1	2	1	1	0	1	0	0	0	0	1
Foot/toe	1	2	2	0	0	0	0	0	0	0	0
Nature of injury											
Concussion	0	0	0	0	2	2	0	0	0	0	0
Dislocation	0	0	0	0	0	0	0	0	0	0	0
Fracture	0	0	0	0	0	0	0	0	0	0	0
Bruise/Contusion/Laceration	5	3	5	0	4	2	0	5	1	0	0
Blister	0	1	0	1	0	0	0	0	0	0	0
Sprain	3	2	1	4	0	1	0	0	0	0	0
Strain/muscle fiber rupture	3	0	2	4	1	3	0	4	0	1	1
Cramps	3	3	20	2	3	0	3	0	1	0	3
Unspecified	0	0	0	0	0	1	0	0	0	0	1

MEN'S DIVISION

There were 14 episodes of injuries on 7 injured athletes with 29% of the injuries, including 2 episodes of strains, 1 episode of sprain and 1 episode of bruise/contusion, was incurred by a point guard. Bruise/contusion/laceration was the most common injuries (36%). Ice was the treatment modality used as physical therapy intervention.

WOMEN'S DIVISION

There were 10 instances of injuries on 6 injured athletes. Most of the injuries occurred in the 4th quarter, with contact injuries being more common (60% of injuries in the 4th quarter) compared to cramps. Ice was the most common form of initial treatment used followed by taping and massage.

VOLLEYBALL

All volleyball players were found to have musculoskeletal malalignments, which existed prior to the competition. There were 5 volleyball players injured during the season, 3 of whom started to play with pre-existing conditions. All, except the libero, developed their symptoms gradually. Only one player had to be temporarily withdrawn from the game on one occasion until symptoms subsided. There were 3 instances where treatment was required but players were able to return to play immediately. Three players, with a total of 4 episodes of injuries, had treatment at the end of the game. Two players had injuries during the warm-up phase probably due to inadequate warm-up stretches, while 5 players sustained cramps secondary to overuse and playing in a humid environment. Ice,

stretching and massage were most frequently used as initial treatments.

FOOTBALL

MEN'S DIVISION

There were 8 injured players with 10 episodes of injuries. Fifty percent (50%) of injuries occurred in a day's competition due to the rainy weather. Sixty percent (60%) of the injuries occurred in the 2nd half of the competition, majority of which were secondary to contact injuries which led to bruises, lacerations, and possible concussions. The players were able to immediately return to activity. Thirty eight percent (38%) of the athletes experienced cramps on the calves. The sports scientist used ice most frequently.

WOMEN'S DIVISION

There were 9 episodes of injuries on 8 football players, all of whom continued to play without treatment. Most of the injuries occurred in the 2nd half of the competition and were brought about by contact injuries. Seventy eight (78%) of the injuries were of sudden onset. All of whom continued to play without treatment. Among them were 2 players who suffered possible concussion, 1 player with suspected neck subluxation and strain, 3 players with bruises on the ® groin, (L) front thigh and ® ribs. All six athletes received treatment after the game with 2 of them being brought to the hospital for possible concussion. A player with ® lower rib pain remained undiagnosed prior to the start of the game. Ice was given most frequently as initial treatment.

ATHLETICS

Three athletes suffered cramps (20%) out of the 15 athletes who were injured. One male player suffered cramps of (B) calves during the competition and 2 other male players had cramps after the game. One of them had cramps on (B) calves and the other had cramps on the abdominal muscles. The muscle spasm had developed suddenly which was secondary to overuse and overexertion. Ice was used to relieve them of their muscle spasms. Two of them received stretches on the calves and abdominals. The athlete who suffered from abdominal cramps was also hydrated.

BASEBALL

MEN'S DIVISION

Three athletes started the play with pre-existing conditions on (L) lower lumbar, (L) upper arm, ® scapula, ® shoulder, and (L) back thigh. A full rehabilitation was not achieved before the commencement of the game. There were a total of 9 injuries incurred by 7 players, 67% of which occurred in a single game. Forty-four percent (44%) were overuse injuries while 56% were of sudden onset, mostly secondary to being hit by a ball.

Majority (86%) of the players did not need immediate treatment and need not be withdrawn from the game. Ice was given as the primary intervention for pain relief. Athletic taping was only utilized once for a strained thumb.

TAEKWONDO

Only two taekwondo athletes sustained injuries during the competition. One had contusion on his ® shin bone. The other athlete developed cramps on the lumbar and sacral regions. Ice was used to relieve the athletes of their pain. The protective gear that the taekwondo athletes wore, the rigid refereeing procedures, the clear-cut rules on engagement and the training that the athletes endured may have contributed to the minimal number of injuries incurred by the UST UAAP Taekwondo Athletes.

SOFTBALL

Only one injury was noted in softball, experienced by a player with a partial ACL tear on the ® knee prior to competition, and reinjured herself during a game which made her unable to return to play. A sudden brake from a run triggered her pain in the ® knee. Ice and tape were given as initial intervention.

LAWN TENNIS

There were 5 injuries noted on 3 players during the competition. Two players had sudden onset of pain on the shoulder and front thigh secondary to overuse and cramps, respectively. They returned to competition after being given initial treatment. A player with fever was allowed to play in a humid environment and was given ice at the nape area to reduce heat, massage on the calves to relieve cramps and chocolates to boost his energy. He consulted a doctor after the game. Ice was the most common modality used for initial treatment. A sports scientist provided the initial remedy to the athletes.

Most Commonly Injured Body Parts and Nature of Injuries Across Sports

Figure 1 shows the most commonly injured body parts in the different sport categories while Figure 2 depicts the various nature of injuries across these sport categories.

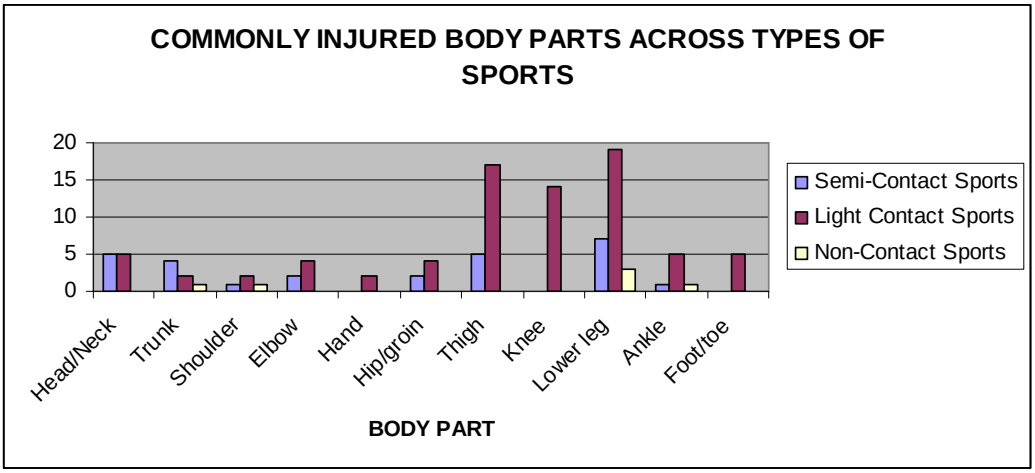

Figure 1: Commonly Injured Body Parts Across Types of Sports

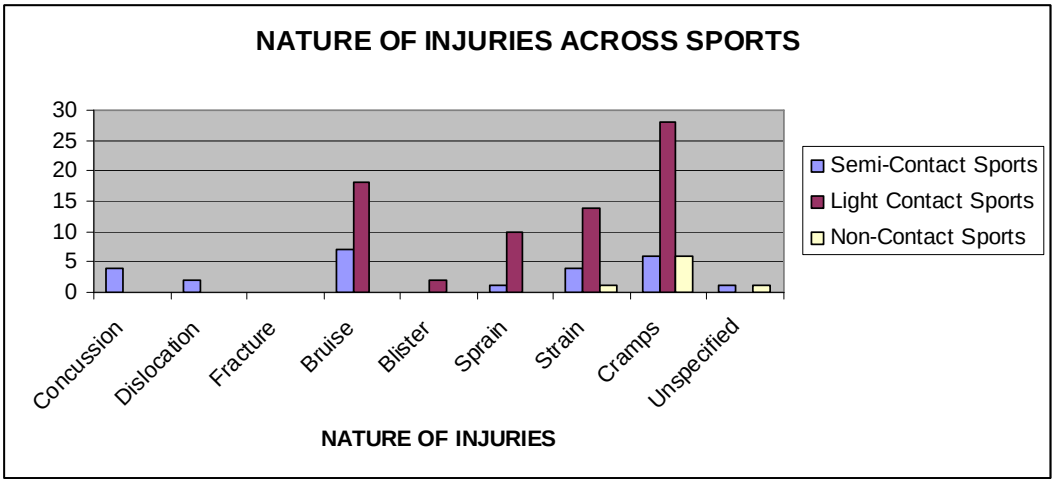

Figure 2: Nature of Injuries Across Sports

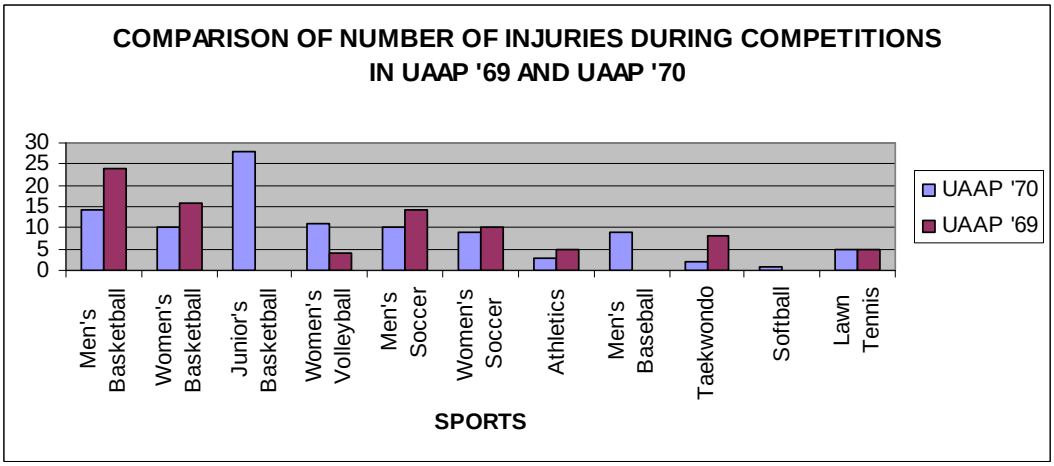

Figure 3: Comparison of Number of Injuries During UAAP 70 and UAAP 69

The lower leg was the most commonly injured body area while cramps was the most common form of injury, regardless of sport category.

Data was obtained in the 69th UAAP Season[6] to allow for comparison of frequency of injuries incurred in Seasons 69 and 70 of the UAAP, as shown in Figure 3. It is noteworthy that in general, there was a decrease in the frequency of injuries in majority of the sporting events participated in by UST athletes.

Figure 3: Comparison of Number of Injuries During UAAP 70 and UAAP 69

Comparison of Injuries in UAAP Season 70 and UAAP Season 69

Table 2 shows the relative risk of injuries in the different sporting events classified per category.

Notably, there was a decrease in the relative risks obtained in UAAP Season 70 compared to those in Season 69. Whereas participation in taekwondo (semi-contact sport) and basketball (light contact sport) events were found to be risk factors in developing injuries during competition in Season 69 as shown by relative risks greater than 1, none of the sporting events proved to be risk factors for injury in Season 70, as shown by relative risks less than 1.

When data in Season 70 is taken by categories, the risk of incurring an injury is higher in soccer compared to taekwondo for semi-contact sports, higher in volleyball compared to other light-contact sports, and higher in athletics compared to tennis for non-contact sports. Taken separately, the junior basketball team has 0.92 risk of incurring an injury which is the highest among the teams which competed in the UAAP Season 70 followed by women's volleyball (0.60), men's baseball (0.47), men's basketball (0.47) and men's soccer (0.44).

DISCUSSION

In the study that the University of Santo Tomas – Center for Research and Movement Science conducted on the incidence of injury in UAAP Season 69, cramps were the most common form of injury.[9] In the UAAP Season 70, cramps were still the most common form of injury found to occur mostly in the calves and were persistent among junior basketball players. Cramps, being a protracted injury that slows down the performance of the athletes, should be addressed with adequate hydration in order to optimize performance among athletes. Heat cramps were found to be a common occurrence in basketball, volleyball, athletics and lawn tennis, probably caused by dehydration following long hours of play.

Dehydration secondary to recent fever was observed in two of the players of basketball and lawn tennis. Some early signs and symptoms of dehydration are muscle cramps, highly concentrated urine, dry mouth, nausea, vomiting, headache, dizziness, confusion, weakness, inability to concentrate, and irrational behavior.[9,10]

It is imperative to drink before competition. General recommendations include intake of at least 2 to 3 cups of fluid 2 to 3 hours before activity and an additional of 1 to 2 cups taken 10 to 20 minutes before the activity. This affords time for excess fluid to be excreted or for additional fluid to be consumed.[11, 12]

Table 2: **Relative Risk of Injuries in Semi-Contact Sports in UAAP 70 and UAAP 69**

		RR UAAP 70	**RR UAAP 69**[6]
Semi-Contact Sports	Taekwondo	0.06	3.22
	Soccer	0.40	1.00
Light Contact Sports	Basketball	0.55	1.43
	Volleyball	0.60	0.71
	Softball	0.07	NO DATA
	Baseball	0.47	NO DATA
Non-Contact Sports	Tennis	0.16	0.50
	Athletics	0.20	0.30

RR- Relative Risk of Injury
UAAP – University Athletics Association of the Philippines

During a competition, water is still a suitable choice of beverage for activities lasting less than sixty minutes duration. However, athletes who are exposed to hot or humid environment, such as those who played in open field and poorly ventilated gymnasium, should consider a beverage that contains certain amount of carbohydrates and sodium.[12] A sound advice is fluid intake of least 1 cupful every 10 to 20 minutes during competition.[12]

Although water is a good choice of beverage to drink in any given occasion, one has to take into consideration the palatability of the beverages. Carbohydrate is the ingredient responsible for the sweetness of any beverage. Voluntary fluid intake should be encouraged to help reduce the risk of heat-related diseases.

Aside from being more palatable, the presence of a small amount of carbohydrate may serve as a fuel source for working muscles in endurance sports. Gatorade Sports Science Institute recommends a sport drink that contains about six percent (6%) carbohydrate.[13] Ingestion of more carbohydrates is not necessarily better as there might be decrease in the rate of gastric emptying and fluid absorption.[14,15,16]

Cramps were most common in Junior Basketball Players. These occurred 20 times among its athletes during UAAP Season 70. For athletes who are prone to severe muscle cramping, one effective strategy to undertake is to drink a high sodium solution. One-half (1/2) teaspoon salt added to sixteen (16) ounces of a sport drink taken over a five (5) to ten (10) minute period is recommended.[17] No statement is issued on electrolyte intake before physical activity. Nevertheless, some athletes who are prone to muscle cramps may consume salty foods or drinks such as spaghetti, cheese, crackers and yoghurt prior to exercise[11].

There is no doubt that proper hydration benefits performance and brings about a good general well-being for athletes. It is most important for athletes to have proper hydration knowledge and practices. In the end, the potential and detrimental effects of dehydration are prevented.

Contact injuries, which included cuts/bruise/lacerations, came second in the most common form of injuries in basketball, and volleyball. Contact injuries, which also came in the form of concussion, were the most common form of injury in football. A rigid and systematic referral system should be ready in such cases since these forms of injuries may be life threatening. A sports rehabilitation team, composed of a certified athletic trainer, team physician, coach, and physical therapist, should be present in all games. The team physician may be an internist, a general practitioner, an orthopedic surgeon or a physical medicine and rehabilitation specialist (PMR).[18]

In the Philippine setting, rehabilitation doctors, physical therapists, nurses, licensed massage therapists and even ergonomists, and tapers play a vital role in the sports rehabilitation team. The objective of any sports medicine program is the immediate, accurate and appropriate medical care of those injured in the physical activity.

The Emergency Care, Assessment, Immediate Care, Self Care, MD Referral, Rehabilitation, Modified Work, and Return to Play/Work are vital keys in the referral system. It is a complicated network where members of the rehabilitation team should work. This intricate system has been working in the Philippine Sports Rehabilitation Team though the process of referral needs to be further strengthened. A clear cut referral outline has to be defined.

An emergency core rehabilitation group has to be activated right away in cases of concussion, and dislocation. Proper activation of unit responsible for athletes with cuts/bruises/lacerations should be emphasized on site.

Athletes with fever should be referred to a physician before being allowed to compete. It is inevitable that temperature further increases in a sick athlete which may lead to slowing down of performance, aggravation of general body malaise, and dehydration. Fitness enthusiasts and endurance athletes have different views on exercising when having a fever.

Intensive exercise should be postponed until a few days after the symptoms have gone away. However, if fever, extreme tiredness, muscle aches, and swollen lymph glands are present, a two-week period of active rest is recommended.[19]

Limitation of the Study

Due to time and manpower constraints, only eleven out of the thirteen UAAP Sport Events were monitored during UAAP Season 70. The sports monitored were only those joined by the University of Santo Tomas student athletes.

CONCLUSION

There is a difference in the relative risk of injury depending on the sports being played. The relative risk of injury was considerably higher in junior basketball (0.92), compared to other UAAP teams. Similar to UAAP Season 69, cramps were still the most common form of injury found in UAAP Season 70, occurring mostly in the calves. Cramp, being a protracted injury that slows down the performance of athletes, should be addressed scientifically by the Sports Rehabilitation Team. A proper and rigid referral system in the sports rehabilitation team should be implemented in UAAP competitions. This is to ensure safety of athletes during UAAP games. Primary prevention through health promotion and education in injury prevention must also be disseminated in all sporting events.

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