

Pattern of Injuries Related to Badminton among Elite Junior Badminton Players in Kandy District - Sri Lanka

Vindya Vimani Senadheera^{1,*}, Agampodi Liyanage Indrajith Prasanna¹,
Sithravelayuthan Mayoora¹, Mahinda Wickramaratne²

¹Department of Physiotherapy, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka

²Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka

*Corresponding author: vindyasenadheera@gmail.com, vindyasenadheera@pdn.ac.lk

Received January 10, 2021; Revised February 11, 2021; Accepted February 25, 2021

Abstract Badminton is one of the most popular sports worldwide. The high physical demands for badminton suggest that badminton players may have frequent occurrences of badminton related injuries. The present study aimed to investigate the pattern of badminton related injuries among elite junior badminton players of Kandy district, Sri Lanka. A descriptive cross sectional study was conducted using an assessment form which consisted of two parts. Sixty two badminton players were included in the study. Among them, 34 players were males and 28 players were females. Age of the players was distributed from 8 years to 17 years. An overall injury prevalence of 33.87% was recorded. Injury prevalence among males was 44.12% and injury prevalence among females was 39.29%. When considering the injury pattern according to location of injuries, lower limb was reported as the most susceptible part for injuries (62.5%). Most of the injuries among males were ankle injuries (40%) and most of the injuries among females were back injuries (28%). Among the injuries 83.33% were acute injuries while 16.67% were chronic injuries. When considering the time of injury onset, 66.67% of injuries were recorded as practice injuries while 33.33% were recorded as competition injuries. Of all the recorded injuries, 79.17% of injuries were slight injuries while 12.5% were minimal and 8.33% were mild injuries. The junior elite badminton players of Kandy district Sri Lanka are at a risk of developing acute injuries during practice sessions. Therefore, injury prevention strategies during practice sessions should be implemented and continued to be monitored.

Keywords: badminton, injuries, pattern, elite, junior players

Cite This Article: Vindya Vimani Senadheera, Agampodi Liyanage Indrajith Prasanna, Sithravelayuthan Mayoora, and Mahinda Wickramaratne, "Pattern of Injuries Related to Badminton among Elite Junior Badminton Players in Kandy District - Sri Lanka." *American Journal of Sports Science and Medicine*, vol. 9, no. 1 (2021): 4-7. doi: 10.12691/ajssm-9-1-2.

1. Introduction

Badminton is a popular sports worldwide. It is a commonly played sport by people of all ages, either recreationally or competitively. It is a racket sport in which badminton racket is used to hit the shuttlecock across a net. Playing badminton involves repetitive movements of upper limb and prolonged gripping of racket with high velocity movements, jumps, lunges, multidirectional movements and rapid postural changes. These high physical demands for badminton suggest that badminton players may have frequent occurrences of badminton related injuries.

Badminton related injuries can be defined as any kind of injury, pain or physical damage that occurs during playing badminton and lead to player being unable to fully participate in training or match play [1].

Incidence of badminton related injuries reported in the literature varies in wide range among different

populations. Most of the reported injuries are minor injuries [2,3,4,5] and lower limb was recorded as the most susceptible part for injuries related to badminton [2,3,6,7,8,9,10]. The majority of badminton related injuries was reported as overuse injuries when elite badminton players from all age groups considered together [5,11]. However, a study among junior elite players had showed that traumatic (acute) injuries are three times more common than overuse injuries in junior players [3]. When the time of onset of injury (during competition or practice) was taken into account it was observed that there were contrasting findings among previous studies. In some studies majority of injuries have been reported to occur during competitions [2,5,6,7,10], while on the contrary, injuries during practice were recorded as the majority by some other studies [3,4,11].

According to the previous studies on badminton related injuries, it is evident that the pattern of badminton related injuries shows a vast diversity among different populations [2-8,11,12,13].

According to the four stage injury prevention model [14], Establishing extent of the injury problem (incidence, severity) and Establishing etiology and mechanism of injury are the initial stages to introduce preventive measures. The TRIPP (Translating research into injury prevention practice) framework [15], for sports injury prevention, also includes six stages including injury surveillance as the first step. Both injury prevention models suggest that injury surveillance should be conducted as the first step of a targeted sports injury prevention programme. High quality scientific information of badminton related injury surveillance is required to inform and guide all the other stages of injury prevention programme. Thereby, a successful injury prevention programme can be implemented and can ensure that the athletes can play safely, demonstrating their full potential in badminton.

According to previous studies, elite junior players are at a high risk of new injury [3]. In Sri Lanka, Badminton is one of the most popular and widely played sports by school children. Every year more than 5000 players from over 150 schools take part in Junior national Badminton competition. There had been an increased excitement and participation in competitive badminton occurred since the commencement of Junior national competitions in Sri Lanka in 1971. Nevertheless, according to current findings, a published research conducted to investigate the epidemiology of badminton related injuries in elite junior badminton players could not be found since 1971 to 2018.

An injury has a negative impact on player's performance. An injured player needs time to recover and will be out of play for a period of time. The recovery time may lead to deterioration of the performance of the player as well. Therefore, the Sports Science and medical research commission of The World Federation of Badminton (BWF), has also emphasized on the prevention of badminton related injuries by making it as one of their three key research goals as, 'contribute towards the increased knowledge on performance and safety at the international level - for coaches and players'.

In a time which Sri Lankan badminton players have achieved the entry to Olympic Games, it is of high need to empower the elite junior badminton players to play with their fullest potential. Injuries will tarnish their performance in competition and practice and thereby may prevent them from future potentials to become international players. Thus, a successful injury prevention programme must be implemented among junior elite badminton players in Sri Lanka. As the first step of injury prevention programme, high quality injury surveillance must be carried out in order to generate scientific information on badminton related injuries among Sri Lankan players and to understand the extent of the injury problem and eventually to identify and implement effective injury prevention strategies. Therefore, the present study aimed to investigate the pattern of badminton related injuries among elite junior badminton

players of Kandy district, Sri Lanka, which will provide an insight on injuries among elite junior players.

2. Materials and Methods

A descriptive cross sectional study was conducted to investigate the pattern of badminton related injuries among elite junior badminton players in Kandy district, Sri Lanka. Junior badminton players who competed at national level tournaments were included in this study. Athletes who engage in other sport/sports other than badminton in competitive level and any player who did not give consent or who did not have parental consent were excluded from the study. Data were collected from 34 male and 28 female junior badminton players of Kandy district, Sri Lanka, who competed under category "A" schools in national level tournaments.

Data for this study were collected by using an assessment form which consisted of two parts. The first part of the assessment form was used to obtain demographic data, information related to training and competitions, anthropometric measurements (height, and weight). Hours of participation in badminton per week were recorded (practice hours and competition hours) by examining team training records. Data regarding duration of playing badminton, warm up, cool down practices were also obtained. Player's height and weight were measured by a standard measuring tape and a standard weight scale correspondingly and were recorded.

The second part of the assessment form was used to obtain injury records. Badminton injury was defined as any kind of injury, pain or physical damage that occurs during playing badminton or training and lead to player being unable to fully participate in training or match play [1]. Acute injuries with clear traumatic cause were classified as a traumatic injury and chronic injuries with no history of trauma were classified as an overuse injury [1].

In the injury record, the type of injury (traumatic / overuse), location of injury (head / neck / shoulder / arm / elbow / forearm / wrist / hand / trunk / back / hip / thigh / knee / leg / ankle / foot), time of injury onset (competition/practice) were recorded. Severity of the injury was classified by the number of days of practice or matches the player missed because of the injury [1]. Ethical approval for the study was obtained from Ethics review committee of Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.

3. Results

Sixty two badminton players were included in the study. Among them, 34 players (54.84%) were males mean age; 11.59 (SD - 2.67) and 28 players (45.16%) were females (mean age; 13.36 (SD - 1.99)). Descriptive statistics of the participants are provided in Table 1.

Table 1. DESCRIPTIVE STATISTICS OF THE PARTICIPANTS ^a

Gender	Number of players	Age (Years)	Height (cm)	Weight (kg)	BMI
Male	34	11.59 ± 2.67	145.56 ± 15.5	37.85 ± 13	17.5 ± 3.62
Female	28	13.36 ± 1.99	150.91 ± 9.76	41.13 ± 8.14	18.2 ± 2.33

^a Values are reported as mean ± standard deviation.

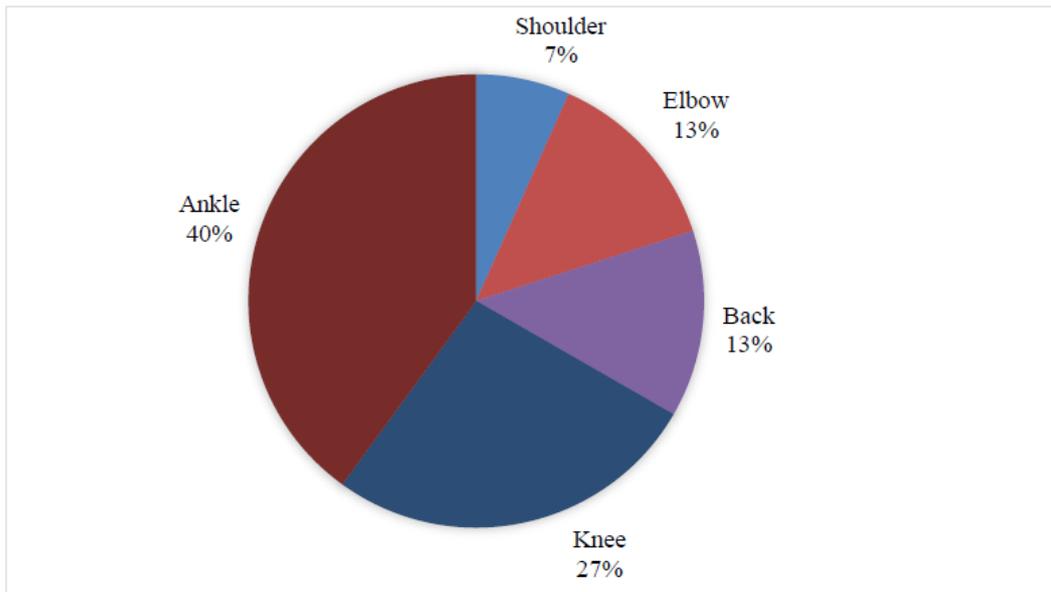


Figure 1. Injury pattern according to location of injury - males

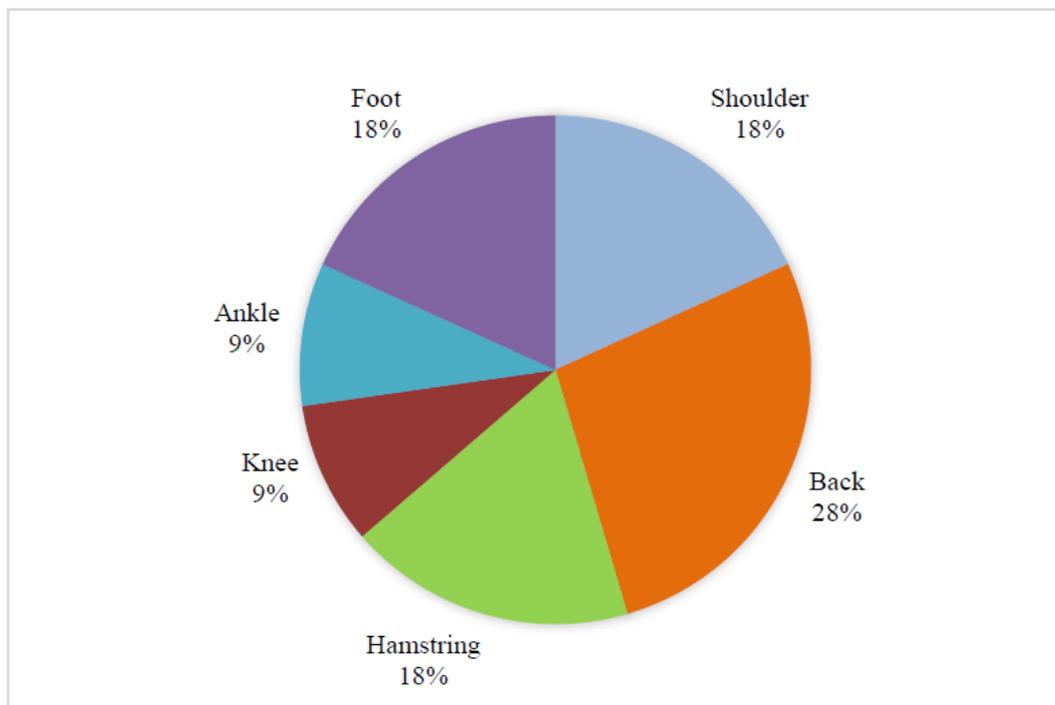


Figure 2. Injury pattern according to location of injury - females

An overall injury prevalence of 33.87% was recorded. Injury prevalence among males was 44.12% and injury prevalence among females was 39.29%. When considering the injury pattern according to location of injuries, lower limb was reported as the most susceptible part for injuries (62.5%). Most of the injuries among males (Figure 1) were ankle injuries (40%) and most of the injuries among females (Figure 2) were back injuries (28%).

Among the injuries 83.33% were acute injuries while 16.67% were chronic injuries. When considering the time of injury onset 66.67% were recorded as practice injuries while 33.33% were recorded as competition injuries. Of all the recorded injuries, 79.17% of injuries were slight injuries while 12.5% were minimal and 8.33% were mild injuries.

4. Discussion

The present study reported a prevalence of 44.12% injuries among male badminton players and 39.12% injuries among female badminton players but the difference was not significant. Similarly, previous studies have observed differences in injury incidence between male and female players, the difference were not significant [4,7,10].

When anatomical distribution of badminton related injuries is taken into account, it was observed that lower limb is the most affected region (58% - 92.3%) according to previous studies [2,3,4,6,7,8,9,10]. These reports go along with the findings of the present study. Badminton, being a sport with vigorous footwork, jumps, lunges, rapid postural changes may place players at risk for lower limb injuries.

The majority of badminton related injuries was reported as overuse injuries when elite badminton players from all age groups considered together [5,7]. However, similar to the present study, a previous research among junior elite players had also showed that traumatic (acute) injuries are more common than overuse injuries in junior players [3]. Exposure to more athletic hours with increasing years of playing badminton may have an effect of developing overuse injuries later in player's life.

When the time of onset of injury (during competition or practice) was taken into account it was observed that in the present study as well as in the previous study among junior players, injuries during practice were recorded more than injuries during competition [3,11]. Involvement of the players in more injury producing activities during practice was assumed to be the reason for this [11]. Injury prevention strategies as warm-up and cool-down during and after practice sessions should be carefully evaluated for their effectiveness, in order to prevent occurrence of injuries during practice. Moreover, strengthening exercises, stretching exercises, resistance training, aerobic training, agility and balance training programmes should be incorporated to badminton training in order to improve and maintain the optimal physical conditions of badminton players [16].

When the severity of badminton related injuries taken into account, the present study showed higher prevalence of slight injuries than minimal and mild injuries. None of the reported injuries were moderate or severe. Similarly, previously reported literature also show that incidence minor injuries was reported as 22% [2], 50% [3], 91.5% [4] and 91.3% - mild, minimal, slight [5] while severe injuries were low among badminton players [2,4,5,6,8].

5. Conclusion

The junior elite badminton players of Kandy district Sri Lanka are at a risk for the occurrence of acute injuries during practice sessions. Therefore, injury prevention strategies during practice sessions should be implemented and continued to be monitored.

Acknowledgements

The authors hereby acknowledge the funding received by University Grants Commission of Sri Lanka, under university research grant - URG/2019/05/AHS.

Statement of Competing Interests

Authors declare no conflicts of interests.

References

- [1] Hagglund M. Walden M. Ekstrand, J. UEFA injury study-an injury audit of European Championships 2006 to 2008. *British Journal of Sports Medicine*. 2009; 43 (7): 483-489.
- [2] Hoy K. Lindblad B.E. Terkelsen, CJ. Helleland HE. Terkelsen, CJ. Badminton injuries—A prospective epidemiological and socioeconomic study. *British Journal of Sports Medicine*. 1994; 28(4): 276-279.
- [3] Goh SL. Mokhtar AH. Mohamad Ali MR. Badminton injuries in youth competitive players. *Journal of Sports Medicine and Physical Fitness*. 2013; 53(1):65-70.
- [4] Shariff AH. George J. Ramlan, AA. Musculoskeletal injuries among Malaysian badminton players. *Singapore Med J*. 2009; 50(11): 1095-1097.
- [5] Miyake E. Yatsunami M. Kurabayashi, J. Teruya K. Sekine, Y. Endo, T. Nishida R. Takano N. Sato S. Kyung HJ. A prospective epidemiological study of injuries in Japanese national tournament-level badminton players from junior high school to university. *Asian J Sports Med*. 2016; 7(1): e29637.
- [6] Hensley LD. Paup DC. A survey of badminton injuries. *British Journal of Sports Medicine*. 1979; 13(4): 156-160.
- [7] Jorgensen U. Winge S. Epidemiology of badminton injuries. *International Journal of Sports Medicine*. 1987; 8(6): 379-382.
- [8] Kroner K. Schmidt SA. Nielsen AB. Yde J. Jakobsen BW. Moller-Madsen B. Jensen J. Badminton injuries. *British Journal of Sports Medicine*. 1990; 24(2): 169-172.
- [9] Fahlström M, Björnstig U, Lorentzon R. Acute badminton injuries. *Scandinavian Journal of Medicine & Science in Sports*. 1998; 8(3): 145-148.
- [10] Yung PS. Chan RH. Wong FC. Cheuk PW. Fong DT. Epidemiology of Injuries in Hong Kong Elite Badminton Athletes. *Research in Sports Medicine*. 2007; 15: 133-146.
- [11] Jorgensen U. Winge S. Injuries in Badminton. *Sports medicine*. 1990; 10 (1): 59-64.
- [12] Reeves J. Hume, PA. Gianotti S. Wilson B. Ikeda E. A retrospective review from 2006 to 2011 of lower extremity injuries in badminton in New Zealand. *Sports*. 2015; 3(2): 7786.
- [13] Senadheera VV. Epidemiological Review of Badminton Related Injuries Among Competitive Badminton Players. *International Journal of Sports Science and Physical Education*. 2019; 4(3): 41-44.
- [14] vanMechelen W. Hlobil H. Kemper HC. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts. *SportsMed*. 1992; 14(2): 82-99.
- [15] Finch CF. A new framework for research leading to sports injury prevention. *J Sci Med Sport*. 2006; 9: 490-497.
- [16] Badminton World Federation. Badminton Coach Education. *Coache's Manual Badminton World Federation*. Kuala Lumpur, Malaysia. 1st edition. 2013.

