

The Prevalence and Causes of Sport Injuries in Well-Trained Badminton Players of Iran

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Abstract

This study was conducted to determine the prevalence rate and some probable causes of sport injuries in Iranian well-trained badminton players. The present descriptive study was retrospectively conducted by an administered sports injuries questionnaire ($\alpha=0.89$). The statistical available sample was including 7 female and 23 male Iranian well trained competitive badminton players with average age 24.1 ± 4.9 . All data were analyzed by Kruskal-Wallis tests using the SPSS statistical software version 16 and the significance level was set at $P\leq 0.05$. The highest prevalence of injuries is muscular and tendon injuries. Highest prevalence of injuries among badminton players is (65.6%). Most injuries in lower extremity respectively are knees (62.5%), ankles (50%), and legs (18.8%). In the most affected areas of upper extremity including wrists (90.6%), waist and back (84.4 %), arms (37.5%). According to the results of this research the incidence of injury in the lower and upper extremities are relatively high in Iranian well trained badminton players. It seems that the use of massage, physiotherapy, continual medical supervision, considering scientific and practical principles, promotion of physical fitness level of athletes can be effective in the prevention of sports injuries.

Keywords: Badminton, Well trained badminton players, Sports injuries.

Introduction

Badminton is one of the most widely played sport in the world. World badminton federation announced that 150 million people worldwide play badminton and about 2,000 players take part in international competitions. This game is suitable for all people in every age and every level (George et al., 2009). The main sports such as rackets badminton, squash, table tennis and tennis are played on the land (pitch). Badminton is an old sport in the world, known since 2000 years ago and 30 years in Iran. The badminton of federation established in year 1973 (Tagie et al., 2008). Badminton has been attracted more attention and recently it has been studied in Asian countries. Badminton is a racquet sport including rockets, shuttles and physical activity. Badminton is a fast sport that requires quick movements and sudden changes of direction. A competitive badminton involves applying a high concentration of running, jumping, spinning, stretching, and walking back. Advanced levels of sport require high speed, coordination, quick reactions, agility and a relatively good physical condition (Guilas et al., 2006). Badminton is a popular sport in the world. Badminton sport is safe. In previous studies, mostly conducted in Europe, it has been found that incidence risk of playing badminton equals 1.6 to 2.9 injuries per 1000 hours, respectively (Kelly, 1987; George et al., 2009). In badminton, injuries often occur with high intensity and low-intensity traumas. Badminton is associated with acute Achilles tendon rupture. Studies have shown that 5% of acute sport injuries occurred in badminton (Høy et al., 1994). Nevertheless, the success and winning national and International champions in a safe environment is almost impossible regardless of abilities, skills and physical fitness of athletes in the physical training. In other words, participation in sports training and competition, especially in the championship, and professional levels, increases the risk of sports injuries (Guilas et al., 2006; Steffen & Engebretsen, 2010). In terms of injuries, evaluating of racket sports squash, badminton, tennis, cricket and table tennis, Barrell et al (1981) showed that badminton is lied in second played following squash. Høy et al (2006) reported that 2.1% of sports injuries that require urgent hospitalization are related to badminton. Also Fukuda et al (2008) noted that hand-grip techniques of getting rocket can cause injury to the hands. The study is conducted to assess the prevalence and some probable causes of sport injuries in well-trained Badminton Players of Iran From early 2011 to 2012.

Methodology

The present assessment was performed using a descriptive and retrospective study. The study sample is consisted of Iranian experienced players of Badminton who were at the average age of 24.1 ± 4.9 with the history of the championship rewards. Due to the limited number of skilled badminton players, Statistical sample included 7 girls and 25 boys national team, premier league. However, all 32 subjects who were experienced badminton players were studied using a combination of questionnaires (open and closed) in three parts. The questionnaire was designed in three parts: The first part contained the necessary information and personal identification of badminton players, the second part was provided to determine the incidence of injuries and the third, to identify the causes of accidents. Initial questionnaire collected questionnaires from previous studies were prepared with some modifications. The logical validity of both questionnaires and medical specialists in physical education, In order to determine the reliability (alpha level) and fix any potential problem, questionnaires were distributed among a random sample of 33 persons (badminton players qualified to play in the Premier League) preliminary forms. Cronbach's alpha coefficient of the questionnaire which was used in this study equaled 0.89.

Statistical methods

Characteristics of the subjects and the obtained data were summarized using descriptive statistics in table 1. Possible differences 16 was tested in the distribution of data in the form of two-valued and multi-valued variables and using non-parametric inferential statistics Kruskal-Wallis by SPSS version 17.0 , at a significance level of 0.05.

Results

Characteristics of subjects including age, height, body mass index, exercise, experience, and championship experience are shown in table 1.

Table 1. Mean \pm standard deviation.

| | Age (years) | Weight (Kg) | Height (cm) | Body mass index (k.m2) | Training experience (years) | Championship experience (years) |
|-------------|------------------|------------------|-------------------|------------------------|-----------------------------|---------------------------------|
| Man (n=25) | 24.96 \pm 5.18 | 75.04 \pm 11.9 | 178 \pm 8.7 | 13.58 \pm 2.6 | 11.56 \pm 5.27 | 6.75 \pm 4.8 |
| Woman (n=7) | 21.43 \pm 2.9 | 54.57 \pm 5.12 | 166.86 \pm 4.48 | 19.58 \pm 2.08 | 7.29 \pm 2.25 | 5.14 \pm 1.95 |

U Mann-Whitney and Kruskal-Wallis tests performed on collected data showed no significant difference between the incidence of sports injuries among male and female badminton players ($p=0.32$). Due to the lack of a significant difference in the injury incidence and experienced team, other statistical analysis were performed on all subjects as a representative sample of 32 subjects. Accordingly, the results of which rate of athletic injuries in men and women badminton players of experienced were significantly more than expected (compared to taking normal damage) ($X^2=10.5, p<0.05$). In other words, about 70 percent of the athletes were suffering from sport injury. Participation rate has also been reported in 59.4% men and 43.8%, women and in individual section which is 43.6%. The most common side effects caused by injury, Pain (87.5%) and inflation (65.5%) (Figure 1).

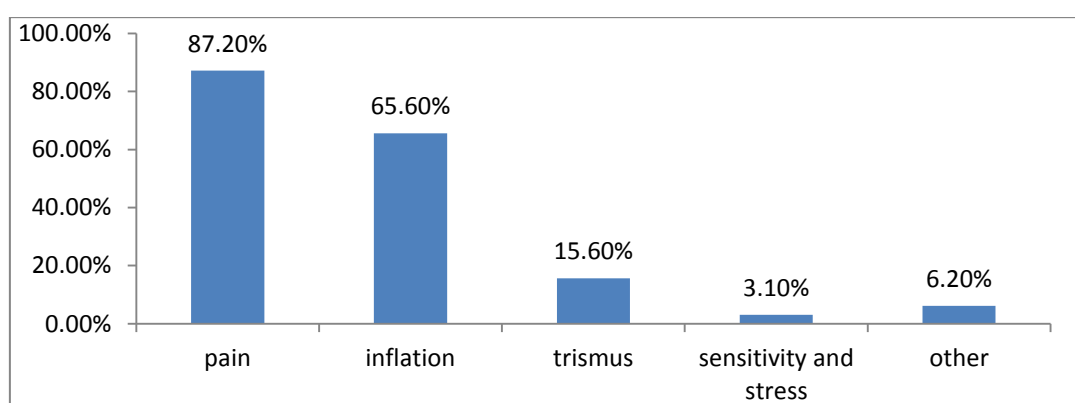


Figure 1. Complication incidence followed by injury.

The highest prevalence of pain were reported in the neck (75%), waist and back (81.2%), wrist (81.2%), Knee (53.1%), and ankles (46.9%) (Figure 2). Most types of first aid received were reported as follow: the bandage (56.2%), And Icing (53.1%). It was reported that most of the players have received their first aid by Instructor (46.9%), and athletes (37.5%).

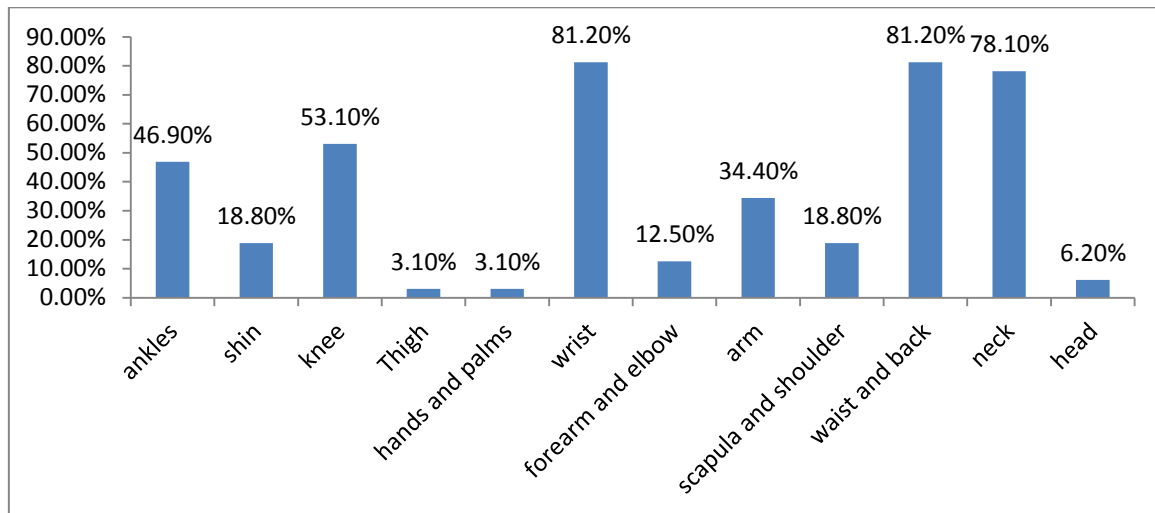


Figure 2. Assessment of effects on components of pain.

It was observed that 37.5% players continued to play despite injury and 65.7% players announced that the motion was properly prevent injury. In the course of rehabilitation the most commonly used therapy were as follow Physiotherapy (53.1%), Icing (37.5%), and water treatment (34.4%). In conjunction with sport injuries in athletic event, the results of the Kruskal-Wallis test showed significant differences between the incidences of sports injuries in badminton fibers were observed ($p>0.05$). Thus, 43.7% of athletes played in individual event, 21.8% players continued to play in both events, and 6.2% were injured in the double event. However, most of the lower extremities (65.6%) and lower neck (3.1%) have had injuries. Extent of damage was dedicated different organs of the body and lower extremities and the highest proportion of injuries were related to the knee area with 62.5 Percent, Ankle with 50 Percent, Leg with 18.8 Percent, Thigh with 3.1 Percent, thus considering the highest and lowest prevalence of athletic injuries of the knee and Thigh and the contribution of different parts of upper extremity injuries. Regarding upper extremity injuries, all of injuries included wrist with 90.6 Percent, Arm with 37.5 Percent, Scapular with 21.9 Percent, Forearm with 12.5 Percent and Hand with 3.1 Percent. Therefore, the highest and lowest prevalence of athletic injuries of the Wrist and hand Back injuries in different areas included 87.5 Percent and abdominal 9.4 Percent. Also, damage to muscle tissue-tendons compared with other sports injuries in various tissues (muscle, joint, bone and skin, respectively) (Fig. 4) in table 2 organ damage and injuries are estimated.

Table 2. Damage organs and tissue damage.

| Tissue damage organ | Muscle-tendon | | Joint-ligaments | | Bone | |
|----------------------|---------------|--------|-----------------|--------|---------|--------|
| | Percent | Number | Percent | Number | Percent | Number |
| Thigh | 3.1 | 1 | | | | |
| Knee | 56.2 | 18 | 28.1 | 9 | 9.4 | 3 |
| Shin | 15.6 | 5 | 9.4 | 3 | 6.2 | 2 |
| Ankle | 31.2 | 10 | 21.9 | 7 | 12.5 | 4 |
| Scapula and shoulder | 18.8 | 6 | 3.1 | 1 | 3.1 | 1 |
| Arm | 25 | 8 | 15.6 | 5 | 6.2 | 2 |
| Forearm and Elbow | 12.5 | 4 | 9.4 | 3 | 3.1 | 1 |
| Wrist | 65.6 | 21 | 43.8 | 14 | 12.5 | 4 |
| Hands and palms | 3.1 | 1 | | | | |
| Thoracic and Lumbar | 65.6 | 21 | 40.6 | 13 | 12.5 | 4 |
| Abdomen | 6.2 | 2 | 6.2 | 2 | | |
| Head | 3.1 | 1 | 6.2 | 2 | | |
| Eyes and Ears | 3.1 | 1 | | | | |
| Neck | 65.6 | 21 | 40.6 | 13 | 12.5 | 4 |

Priority order and harmful factors in terms of sport injury involves in not having special fitness sport (54.2%), Continuous training (21.9%), Failure to obtain first aid (28.1%), Failure to use safety devices (28.1%), Initial injury (28.1%), Lack of land use standards (81.2%), No separate meetings in terms of physical fitness (43.8%), Lack of awareness of performances (12.4%), Muscle imbalance (18.6%), Disease (9.3%), Lack of skills (9.3%). However, it should not be overlooked that 44.9% Injured athletes have been damaged before the racing season with moderate mental preparation (44.9%). Based on these results, significant difference was between the incidence of sports injuries in men and women, nationally experienced badminton player and league matches before the season ($X = 10.75, p < 0.02$) (table 3).

Discussion and Conclusion

The results of the current study was to determine the prevalence and causes of sports injuries among experienced badminton players during the one year between the years of 2011 to 2012 AC. It was indicated firstly that the relative incidence of sports injuries (skin, muscle-tendon, joint, ligament and bone) was significantly higher in the sport (with regard to healthy and injured). However, factors such as Parents and teachers who may expect their offspring or students to win, personal motivation, peer influence, perceived resistance or unwillingness to continue beside exercise encouragement and sensitivity of future events were major interventions in enhancing pathogenic contribution. The injuries of the muscle- tendon (75%) found in the previous study of Høy et al (1994) and Maquirriain et al (2006) is not in consistent with the result of present study which latter may be due to the lack of alignment in Høy study consisting three groups of male professional, non-professional and non-professional men and women. However, in our study, all participants were nationally experienced and trained. It may be concluded that the incidence of muscle-tendon injury in trained athletes is significantly higher and thus being accompanied by with other types of joint injuries-ligament (43.8%) and bone (14.5%).

In the present study, no significant differences were observed between sporting events in terms of injuries. It was reported that Injury rates were 43.7% per individual event, 21.8% players at both events and 6.2% Double injury in the incident. The results of current research indicate that the event does not depend on the type of athletic injuries. Badminton players are the most common athletes at risk of injury. In this regard, Okhovatian et al (2009), George et al (2009) Common injuries in golfer's elbow (54.2%), back pain (36.5%) and tennis elbow (21%) of athletes. The highest rates of lower extremity injuries (6.5.5%) that the previous results Guilas et al (1994), Høy et al (2006), George et al (2009), Pluim et al (2006) are in consistent with present study. This issue reveals that Proportion of lower limb injuries was significantly higher than other organs. Equal share of the other organs is the head and neck (3.1%), trunk (9.4%), upper extremity (9.4%), internal organs (43.8%). In present study it was demonstrated that the complication of pain in body parts, back, wrist, neck, knee, ankle, arm, leg, shoulder, shoulder, arm, head, leg and arm and palm is in consistent with previous studies involving Maquirriain et al (2006) and Tagie et al (2008). However, Tagie has announced more shoulder pain, whereas in this study the highest rate of back pain has been reported. However, the most used rehabilitation methods include physiotherapy (53.1%), icing (37.5%), Water Treatment (24.4%), Strengthening exercises and gradual (15.6%), and heat treatment (9.4%) was Research in Tagie et al (2008) and Kevin and Batt (1997) Physiotherapy.

In addition, 71.8% of sports injuries (40.6 percent for the second time and 1 percent, recurrent injury) occurred as a result of previous injury. In other words, it is most likely that previous injury and increase its share in injury incidence during sports contests involved. This finding studies Tagie et al (2008) is in consistent with present study. The results of current study confirm the fact that Badminton athletes, especially in areas of lower extremity injuries of the knee (62.5%), and ankles (50%), because the result is more practical or technical movements down the moment the shift is done the findings George et al (2009) correspond to. Research Kondric et al (2011) Comparison in Three sports, table tennis, tennis and badminton earth, badminton had more injuries in the ankles, Spine and Shank Were reported. In these three exercises, leg injuries are nearly equal According to our results Injury in the ankle and spine were the involvement of spinal cord injury due to bursts that need more flexibility and it is under pressure.

In a sudden twist of the knee, as well as to shift the badminton athletes more on toes throughout the game to be. Skip back or jump up and down rapidly, causing injury to the ankle is Inappropriate the findings Kondri et al (2011), George et al (2009), Lagman et al (2006), is aligned. The overall incidence of injury in different organs is as follows, Lower extremity (65.6%), internal organs (43.8%), upper extremity (9.4%), trunk (9.4%) and head and neck (3.1%) patients. As expected, lower extremity injuries is higher than findings of George et al (2009). On the other hand, in the present study are mentoring programs warming this cause the players to warm their body properly and will cause less damage. However, in the present study was observed in the pre-tournament injury (46.9%) is higher the findings Okhovatian et al (2009) are opposite. The extent of injuries occurring in cold climates (59.4%) is aligned with the findings Fahlstrom et al (1998).

However, due to the contribution of sport injuries in badminton string, we can conclude that the incidence of sports injuries in men and women with a mean age of 24.1 ± 4.9 years experienced badminton player in Iran is relatively high. Hence, in order to reduce injuries to athletes during athletic exercise and health promotion is recommended, at least from increases in the educational facility-training and classes for educators to use in the field of injury in badminton and ways to deal with, it is up to teachers' knowledge in this area. Moreover, given the high share of all types of sports injuries (skin, muscle - tendon, joint -ligament and bone) in the lower extremities, particularly the knees Badminton players are recommended to strengthen the muscles in this area and Proper training and body building exercises, specifically in the area of injury prevention. However, due to the limitation of the present study retention problems including sports injuries is recommended reducing injuries, designing and manufacturing electronic card personal characteristics (Identification with the sport's all-sports) and is made possible to build the database to achieve accurate and reliable health status in athletes for coaches, technical officials and doctors sports teams for training programs and medical advice and also the research study-the development. However, the treatment team includes a physical therapist; massage therapist, psychologist and medical team can prevent injury to bring badminton players.

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