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Injuries in Basketball

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Abstract: Understanding the epidemiology of basketball injuries is crucial for developing interventions and education aimed at reducing injuries. The purpose of this literature review focuses on the epidemiology of musculoskeletal injuries in basketball players. This review examined data from studies in basketball high school and professional level. The results revealed that most of the injuries were in the lower extremities, with the ankle and knee being the most common sites. Ankle injuries often resulted from floor impact during jumping, while knee injuries were influenced by the maximum ground reaction force. Other injury areas included the wrist/fist, head and neck, and shoulder/arm. Risk factors encompassed abrupt player movements, jumps, landings, precision, and training errors, along with a lack of physical abilities. In conclusion, the endogenous and exogenous nature of risk factors underscores the need for proper training of coaches and fitness professionals. Injury reduction requires effective management of training loads, efficient rehabilitation, and prevention of risk factors during both practice and matches.

Keywords: basketball injuries, epidemiology, musculoskeletal injuries, risk factors, injury prevention, rehabilitation.

1. Introduction

1.1. Injuries in basketball

In the last century, basketball has become one of the most popular sports in the world [6]. Basketball-including those who play recreationally-in organized teams, for high schools, colleges, and professionally-than any other sport in the United States [18]. Last year, 540,769 boys and 399,067 girls participated in high school basketball in the 2018-2019 academic year [5]. From the first National Collegiate Athletic Association (NCAA) basketball championships(1939 for men and 1982 for women), men's and women's basketball has become one of the most popular sports to play and watch. Once out of touch, the game has evolved along with the athleticism of players from Naismith's original "Thirteen Rules". Basketball is a fast, intense and aggressive sport. Consequently, basketball players have one of the most overall injury rates among participants in non-athletic sports impact [7]. The severity of the injury can be manifested by change in activity or lifestyle, lost games and/or impact on livelihood if playing professionally. Understanding the epidemiology of such injuries is important for all healthcare providers and professionals who associated with team sports.

1.2. Descriptive Epidemiology and Mechanisms of Injury with Predictive Factors

Many studies have evaluated the types and frequency of injuries that basketball-related injuries [13]. Some studies focus on children, adolescents, and high school students [17]. Others analyze the rates injury rates only in student-athletes in college [22] or professional athletes [10]. Following is a general consensus of their findings.

According to a descriptive epidemiological study in 2007 that evaluated basketball-related injuries in American high schools, of 409,958 injuries, the most common body parts injured were the leg and the ankle (39.7%), knee (14.7%), head/face/neck (13.6%), arm/hand (9.6%) and hip/lower/lower/upper leg (8.4%) [4]. The upper limb injuries accounted for only 12-13% of injuries that suffered. Although the authors included chronic injuries in their assessment their assessment, they report that the majority of injuries were young (83.6%) as opposed to a exacerbation or recurrence of a previous injury.

The most common injury diagnoses reported by Borowski et al. were ligament sprains (44.0%), muscle/tendon strains (17.7%), muscle strains (8.6%), fractures (8.5%) and concussion (7.0%).Fractures occurred most frequently in lower arm/hand (42.7%), head/face/neck (23.9%) and leg/ankle (19.0%) [4].

In terms of gender differences, Borowski et al. found that girls were more likely to sustain a knee injury and that boys were more likely to suffer injury to their trunks and leg/ankle areas [2]. However, a more recent surveillance data study revealed that the most commonly injured body parts for girls were the ankle, knee and head/face [11] compared to the ankle, head/face and knee in high school boys [15].

Although the difference was not significant, girls were more likely to suffer injuries requiring surgery than their male counterparts, particularly for ligament sprains (10.2% and 2.9%, respectively) and strains muscle/tendon strains (10.1% and 5.0%, respectively). They had more than twice as many twice as likely to need surgery for a knee ligament injury (injury ratio, IPR 2.74, 95% CI 1.21-6.23, P < 0.01). Boys were found to be 4.43 times (95% CI, 1.25-15.68 P <0.01) more likely to require surgery for head/face/neck fractures [2].

According to Borowski et al., (2008) a quarter of all injuries that suffered by high school athletes occurred during rebounding (25.1%), while on defense (14.8%), ball handling/handling (8.9%) and shooting (8.5%) [2]. Boys were more likely to sustain an injury when rebounding (IPR 1.72, 95% CI, 3.98-20.63, P <? 0.01) and girls were more likely to be injured when handling the ball (IPR 1.68; 95% CI, 1.10-2.55; P = 0.02). Another study found that 22.6% of girls' injuries occurred during rebounds and 20.1% when they were playing defense in games [4].

At present, there is no consensus on the effect of the position on the injury rates in high school athletes. Among male and female basketball athletes high school basketball players, Borowski et al. found that guard position accounted for most injuries (50.3% and 45.9%, respectively) followed by the forward (34.7% and 40.8%, respectively) and center position (14.1% and 13.0%, respectively) [2]. They found that the type and location of injury did not differed according to position: guards, forwards and centres suffered "rankings ligament' and 'ankle/foot' injuries more frequently [2]. Clifton et al. found that an ankle sprain due to contact with another player was the most common injury among all positions for both boys and girls [3].

1.3. Professional leagues

Although fewer studies have been conducted on injury rates in professional basketball players over the past two centuries (20 , 21 , 29 , 30), the improved surveillance data has aided in the evaluation of injuries at the professional level. Compared to NCAA basketball, professional athletes play for more minutes per game and for longer seasons. Such factors could contribute to the increased number of injuries at the professional level. However, the false report injuries to retain injured players (allowing teams to keep injured players on the field) players to their roster) could also affect the accuracy of reporting at the professional level. However, professional players basketball in the U.S. and abroad tend to experience a higher rate of injury compared to other levels [19]. The incidence of injury in players in the National Basketball Association (NBA) was found to be 19.1 per 1000 AE [9].

Compared to the Women's National Basketball Association (WNBA), the NBA players were found to have a lower rate of injury-related game-related injuries (19.3 vs. 23.9 injuries per 1000 AU) [9]. Again, lower limb injuries are the most common, accounting for over 60% of all injuries at the professional level [7]. The incidence of ankle sprains (3.2 per 1000 AE) is more than twice as common as any other injury in the NBA [7]. Lateral ankle sprains, in particular, are the most common injury diagnosis in both the NBA and WNBA [7].

There is not much data available on the distribution of the rate of injury rate per position player in the NBA. According to an analysis of Brazilian professionals basketball players, centers were found to have the highest number of injuries (44.1%) followed by forwards (35.3%) and guards (20.6%) (Moreira P. et al., 2003). Compared to other locations, the centers suffered more hand injuries, chest and abdomen and had a higher number of ankle sprains. They were more likely to be injured when they were in the racquet area, where more physical contact during rebounding or aggressive driving (Moreira P. et. al., 2003). Among Greek professional players, the highest number of injuries occurred in and around the racket area (56.3%, P = 0.007). player positions examined, centers had the highest rate of injury with small forwards having the lowest injury rate (Kofotolis N. et. al, 2007).

McKay et al. found that among elite Australian female basketball athletes, the ankle injuries were responsible for more than half of all ankle injuries among elite elite athletes time lost to injury (McKay GD et. al., 1996). Among NBA players, the knee injuries were the most common cause of lost games (17.5 % of all [9]. As reported by Drakos et al. patella and knee injuries (e.g. internal derangement) led to more missed games than ankle and lumbar spine injuries (the two most commonly injured areas) [9].

2. Lower limb injuries

2.1. Foot and ankle injuries

2.1.1. Ankle sprains

Among male and female basketball players of all ages, the dominant players are injuries to the lower limbs, with the ankle being the most commonly injured anatomical point and low or lateral ankle sprains representing the most common injury. Studies show that basketball players change movement every 2.0-2.82 seconds and jump up to 35-46 times per game (Matthew D. et. al., 2009). Frequent changes of direction and jumping have been linked to injuries in the ankle injuries (Nelson AJ et. al., 2007). The most common mechanism of injury in sprains low ankle sprains is an inversion injury with the foot in light plantar flexion, usually occurring through contact (e.g., when a player steps on the foot of a another player's foot). It can also result from an awkward landing directly on the field or from a twisting injury caused by a cut, twist or pushing. In a 10-year surveillance study of ankle injuries in NCAA, the most common diagnosis for male and female players was an injury to the lateral ligamentous complex (low ankle sprain) including the anterior crest ligament and the pterygoid ligament. In men, 79.97% of ankle injuries, 7.24% involved the deltoid ligament and

7.01% involved the anterior tibial ligament (high ankle sprain) (Tummala SV et al., 2018). The majority of the women also experienced pain (83.47%).The ligamentous 7 injuries were the second most common injury in women (7.05%) followed by ruptures of the deltoid ligament (5.57%).

Injuries due to inversion result in a sprain or disruption of the cruciate ligament usually followed by the pterygoid ligament. Such injuries may occur with concomitant injuries that may be radiographically occult, including cartilage or osteochondral lesions (Taga I. et. al., 1999). In addition, fractures of the anteroposterior process of the heel and tears in the upper peroneum with supra-articular dislocation of the peroneal tendons can sometimes mimic a lateral ankle sprain. Thorough clinical evaluation of both ankles together with advanced imaging can help identify associated pathologies. The injuries due to distraction are less frequent. However, they also occur secondarily in dorsiflexion with leg abduction or external rotation. These injuries, which often lead to high ankle sprains, may be more severe due to injury to the deltoid ligament, the anterior tibiofibular ligament and the mediastinal membrane with disruption of the ligament. Preventive measures at all levels play have focused primarily on ankle inversion injuries. The players generally wear medium or high-top sneakers and many are encouraged to tape their ankles or wear braces. The external support of the ankle support has been shown to reduce the risk of ankle sprains (Olmsted LC et. al., 2004). Studies have shown that external ankle support in the form of splints or tape can prevent injury (Leanderson J. et. al., 1993). Kofotolis et al. found that in the Greek WNBA, most injuries occurred when players did not wear ankle braces (Kofotolis N. et. al., 2007). Since a historical sprain or sprain on the same side of the ankle is a strong predictor of re-injury, athletes who have a history of ankle sprain will benefit from the use of external support in this ankle. Studies have shown that athletes with a previous sprain who wear splints or taping have a lower incidence of ankle sprains (Beynnon BD. et. al, 2002).

2.2. Fractures stress

2.2.1. Fractures of the foot

Fractures of the anterolateral process of the heel occur when the foot is abducted and plantar flexion. This mechanism exerts tension on the bifurcated ligament, which connects the anteroposterior heel to the cuboid and scaphoid (McDermott EP 1993). Acute dorsiflexion with strong contraction of the peroneal muscles can also lead to ruptures of the ligament. In this case, a small bone fragment may break off from the fibula where it was previously attached (seen as a sign of flake on plain radiographs). With disruption of the ligament, the peroneal tendons are allowed to flare forward out of their groove.

Detachment fractures of the bone and the base of the fifth metatarsal can also occur with symptoms similar to low ankle sprains. The detachment fractures of the fifth metatarsal usually result from inversion stress. For example, when a player goes up for a rebound and lands into another player's foot. The same strong contraction that contributes to the SPR tear can lead to a severing of the attachment of the peroneus brevis at the base of the fifth metatarsal. Although not as common, a detachment may also occur in the beginning of the extensor digitorum muscle (EDB) from the lateral heel.

Stress injuries are also common occurrences in the NBA. In a study of 75 NBA players by Khan et al. found 76 stress injuries to the lower. Over half (55%) involved the leg with most of the injuries being occur during the regular season (Khan M. et. al., 2018).Specifically most commonly reported injury was a stress fracture due to fifth metatarsal (18.4%) followed by other stress fractures of the foot (14.5%) (Gomez E et. al, 1996). The least reported foot stress fractures were in the sesamoids of the heel and tarsal bones (Gomez E et. al., 1996). Over a third (38.2%) of the stress injuries reported by Khan et al. were treated surgically. Fifth metatarsal fractures were surgically treated in 100% of the time with open reduction internal fixation. Although all were treated surgically, Khan et al. found that the stress fractures due to fifth metatarsal resulted in the inability to return to the game in 42% of players (Khan M. et. al., 2018).fifth metatarsal resulted in an inability to return to play in 42% of players (Khan M. et. al., 2018).

2.3. Achilles tendon injuries

In the NBA, the majority of Achilles tendon ruptures occur early in the season (Lemme NJ et. al., 2019). The most common mechanism of injury is the taking off from a standing position just prior to toe-off in a dorsiflexion of a dorsal foot. Achilles tendon rupture is a catastrophic injury with low rates of return to play for athletes who have undergone Achilles surgery (Minhas SV et. al., 2016).Compared to other surgical procedures, NBA players who underwent Achilles tendon repair had a significantly greater reduction in postoperative performance outcomes at postoperative time points of 1 and 3 years and had shorter career durations compared to other surgeries (Minhas SV et. al, 2016).Despite these results and low return to play rates in professional basketball players after Achilles tendon repair, the surgical surgery is still the most promising option available in this patient population.

2.4. Acute ligament injuries

2.4.1. Anterior Cruciate Ligament

Anterior cruciate ligament disorder is a serious injury with significant loss of playing time and a long rehabilitation program after the surgery. Busfield et al. showed that 22% of NBA players failed to return competition and nearly half (44%) of those who returned had a lower player performance ratings (Busfield BT et. al., 2009).

Most orthopaedic injuries affect men and women equally basketball players. However, ACL injuries in basketball players show strong female predominance (Prodromos CC et. al., 2007). In a review of injuries that suffered on the University of Connecticut basketball teams, women suffered ACL injuries at two to four times the rate of their male counterparts [20]. In a meta-analysis of ACL injury incidence as a function of gender and sport, the female to male ratio was higher 3.5:1 in basketball compared to 2.67:1 in football and 1:1 in alpine skiing (Prodromos CC et. al., 2007). Multiple studies have evaluated possible reasons for the differences gender differences in ACL injuries.

The mechanism of injury of PCA injuries is most often non-contact, the slowing down and sudden change of direction that can cause abnormal rotation of the tibia. It also contributes to the collapse of the knee valgus, which occurs more frequently in women (Krosshaug T et. al., 2007). Increased abduction of the knee leads to an increase in knee abduction torque, which has shown a high sensitivity and specificity for injury risk (Hewett TE et. al., 2010). The factors that account for the increased risk of injury in female athletes include. The predisposition of women to land with increased knee abduction. The latter factor was found to be correctable with dynamic proprioceptive training [20]. It is important to note that in skeletally immature athletes, a common pattern injury of the PCL is a comminuted fracture of the tibia or less commonly the tibia or less commonly the femur (Hewett TE et. al., 2010). chondro-osseous junction is the most weakest part of the PCA complex in such patients.

3. Core injuries

3.1. Pelvis and Hip

Soft tissue injuries to the groin and hip are moderate frequent in basketball players. In a 16-year longitudinal study of injuries in the NCAA men's basketball, "pelvis, hip and upper leg" injuries in the form of muscle strains and sprains accounted for about 10% of the injuries that game-related injuries and 11% of injuries sustained in practice. [8]. Across all data, thigh injuries were more prevalent, especially muscle strains and bruising in the muscle groups of the adductor, rectus abdominal, femoral and thigh (quadriceps) [9]. Jackson et al. found that strains were more common during the first month of the season (preseason) with the cumulative risk being related to the duration of each season and the duration a player's career (Jackson TJ et. al., 2013).
Today, there is increased awareness and understanding of the intra-articular hip pathology. However, most hip injuries associated with sport in basketball players are extra-articular (Jackson TJ et. al., 2013). Intra-articular and extra-articular hip pathologies in basketball players are current topics of ongoing research.

3.2. Lumbar spine

Injuries to the lumbar spine are relatively common among basketball players and account for a significant percentage of missed games. They are interestingly, a large percentage of these injuries are classified as 'muscular strains', as this is the most common symptom. Muscle strains and bruising present with back pain without radiation to the lower extremities and are treated conservatively. Unless a player has radical symptoms indicative of a symptomatic herniated disc, MRI plays a limited role in injuries of the back injuries.

In young athletes, pars interarticularis defects are an important source of lumbar pain. Pars defects with or without resultant spondylolisthesis can be detected on simple films and are often diagnosed with advanced imaging. Careful evaluation of the posterior spinal elements (particularly O5) is critical.

In the NBA, lumbar spine injuries accounted for 6.8% of all injuries over a 10-year period. This translated to 11% of all days a player missed for injury. The injuries to the cervical spine injuries accounted for 1.3% of all injuries, followed by sacral spine injuries (0.6%) and thoracic spine (0.5%) [20].

4. Upper limb injuries

4.1. Fractures of the hands

Hand and lower arm injuries predominate over hand and lower arm, shoulder and elbow injuries. Injuries to the hand can be particularly devastating for basketball players, as the dominant and non-dominant function and dexterity of the hands are critical to the game. The fingers and thumb represent the most likely location of an acute orthopedic fracture in basketball players. In 2017, Morse et al. published a study evaluating players in Inactive list (IL) players who missed games due to hand injury or those who underwent surgery as a result of a hand injury. One hundred and thirty seven injuries were identified with 71.5% of the injuries occurring in the

fingers and 28.5% of injuries to the hand (Morse KW et. al., 2017).According to the findings the authors' findings, there are major patterns of hand injuries in NBA players: lacerations thumb ligament tears (e.g., ulnar collateral ligament injuries) (Morse KW et. al, 2017), metacarpal fractures and phalangeal fractures. No relationship was found between type of injury and location (Morse KW et. al., 2017).

The proximal interphalangeal joints are the most commonly injured sites. In PIP, injuries to the joint capsule can occur and can lead to disruption of ligaments and tendons as well as intra-articular fractures. The dislocation or forced bending at the PIP joint may lead to acute rupture or chronic weakening of the triangular ligament at the peripheral end of the central slip.

Such injuries are common in basketball players. The injury leads to deformation of the bumper, in which the lateral ligaments conveniently migrate with resulting in flexion of the joint and hyperextension at the distal interphalangeal joint.

Injuries to the joint have been reported in the terminal extensor tendon and the flexor of the fingers, as well as fracture/dislocations (Morse KW et. al., 2017). If more common in baseball, hammer finger injuries (the splitting of the terminal extensor tendon from the distal phalanx) occur frequently in basketball as a result of ball entrapment at the tip of the finger [19]. The violent overextension of the DIP joint leads to detachment, as illustrated by a jersey that torn from the finger. This injury occurs most commonly in football players and rugby players. However, it can also be seen when a player catches his finger on a basketball net. In addition, "injuries" may occur secondary to the impact of a player's hand with sharp edges of the lip.

As previously mentioned, injuries to the metacarpophalangeal joints also occur more frequently in the thumb with injury to the ulnar collateral ligament. The mechanism of injury for thumb injuries is the moment abduction at the thumb joint, which occurs most often with falls in outstretched hands with the thumb abducted. The dorsal dislocations of the carpometacarpal are most common on the ulnar side of the hand.

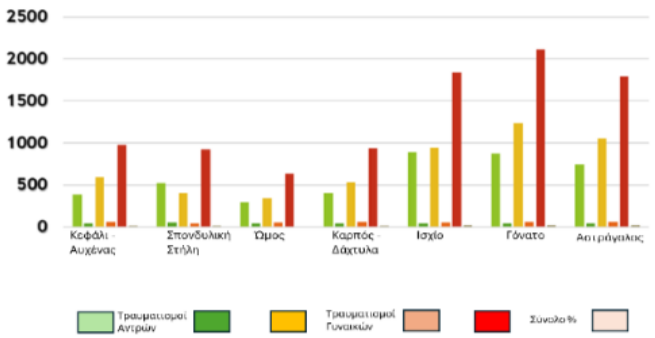
4.2. Shoulder

Shoulder injuries are relatively rare in basketball. At the high school level, the frequency of shoulder injuries over two seasons was 0.47 injuries per 10,000 exposures for boys and 0.45 injuries per 10,000 exposures for girls[19]. In the NBA, the most frequently identified diagnoses of shoulder injury were 'glenohumeral sprain', 'acromioclavicular joint sprain' and 'inflammation of the rotator cuff' [19].

Table 1 Men's basketball injuries (multiple choice)

Injuries	Percentage
Head-Face	2,7%
Shoulder	9,0%
Hand	7,2
Fingers	27,8%
Lumbar Fossa	14,3%
Legs	13,0%
Knee	8,0%
Ankle	15,0%
Other	3%

Figure 1: Anatomical area of injuries in basketball players



5. Non-Orthopedic Injuries and Diseases

A detailed review of the epidemiology of orthopaedic injuries is beyond the scope of this chapter. However, it is important to note the impact of non-musculoskeletal pathologies in relation to overall health of the athlete.

Injuries to the head, face and neck often occur with a collision. Such injuries, including fractures of the nose and facial fractures, eye injuries and dental injuries account for 13.6% of all injuries. of injuries in high school basketball. Nasal fractures account for 1.5% and 1.7% of injuries in NBA and NCAA men's basketball, respectively. The eye injuries include eyelid lacerations, corneal abrasions and severe orbital fractures with injury. Injuries (including dental) are common in basketball. In intercollegiate athletes, it was founda fivefold increase in the risk of dental trauma in basketball players compared to football players.

In women's collegiate basketball, concussions accounted for 6.5% of all injuries during games and 3.7% of all injuries during training [1]. Players were three times more likely to three times more likely to sustain a concussion during a game compared to practice. Concussions were reported less frequently in NCAA men's games (3.6% during games) and in the NBA [1].

In terms of medical, non-orthopedic causes of missed games in athletes basketball players, skin infections and diseases related to the upper respiratory tract are the most common. tract, gastrointestinal tract and eye were the most frequent. Among all high school athletes, skin infections thaled to time loss were reported at an incidence rate of 2.27 per 100,000 athlete exposures with the highest number occurring in wrestling (73.6%), followed by football (17.9%).The boys' basketball accounted for 1.9% and girls' basketball for 0.6% of skin infections. Skin infections among boys' basketball players were predominantly bacterial in origin (50%), with the remainder consisting of tibial lesions (~20%) and unspecified organisms (~20%). The part of the body affected was not reported specifically for basketball, but among all athletes, infection of the skin infection occurred most frequently on the head/face (25.3%), followed by the forearm (12.7%), upper arm (8.0%), lower leg (7.0%), knee (6.8%) and thigh/upper leg (5.7%). The return to play varies, but the most common timing of return to play is frame was within 3-6 days after identified infection. Minimal data were available for professional basketball, but it was reported in the NBA that dermatological problems occurred in less than 5% of the athletes, corresponding to less than 5% of the 1% of lost matches [1]. No data were found between athletes at collegiate level.

Upper respiratory tract infection accounted for 16.7% of all upper respiratory tract injuries and illnesses in the NBA, second only to sprains (20.9%) [1] gastrointestinal, dental and eye problems accounted for less than 6% together resulting in less than 2% of games lost. There was a reportH1N1 influenza epidemic among professional basketball athletes from 18 different countries (218 teams, 3024 players) during the 2009 H1N1 pandemic [1]. Among 29 teams in the USA, five cases were reported and it was found that the number of players per team was shown to be a marginal risk factor for H1N1 cases (OR = 1.19, 95% CI: 1.00-1.41, p = 0.056).

Stress can also contribute to illnesses and games being lost. In a study of female basketball players, a moderate positive correlation was found between stress (total stress required of the athlete over a one-week period) and monotony (defined as the variability of practices for the entire season).

However, there was no correlation between the number of illnesses vs. weekly training load. More illnesses were reported during the midterms and at the end of the semester, suggesting that other life stressors play a role in faculty athletes, but not necessarily the physical condition itself.

Finally, and most importantly, healthcare providers should understand the risk of sudden cardiac death in basketball players of all ages. In most cases, in basketball players it is the result of a congenital or structural abnormality such as hypertrophic cardiomyopathy, Marfan syndrome or myocarditis. Sudden cardiac death is often reported in young athletes in high school and college level. Prevention requires awareness of all professionals health care professionals who care for athletes and careful medical screening of prospective players.

6. Conclusions

From the review of the global scientific literature, it is clear that most common injuries in basketball players are related to the lower limbs, particularly the especially the ankle. Understanding the epidemiology of these injuries is a critical step for the development of interventions and education focused on prevention.

Analysis of the results reveals that injuries to the lower limbs account for 60.2% of the total percentage, of which ankle (19.4%) and knee (22.8%) are the main areas of affected injuries. The ankle is mainly injured during jumping, while the knee suffers from the maximum reaction force. In addition, it can be seen that other areas of injury include the wrist/fist (10.9%), head and neck (10.5%), and shoulder/arm (6.8%). Risk factors include sudden changes, jumping, landing, precision, and training errors, while lack of physical ability is an endogenous risk factor.

Overall, the research highlights the need for specialized coach education andimplementation of preventive measures to reduce injuries during training. The need for a number of measures to increase the need for training and training and competition.

7. References

[1] Agel J, Olson DE, Dick R, Arendt EA, Marshall SW, Sikka RS. Descriptive epidemiology of collegiate women's basketball injuries: NCAA Injury Surveillance System, 1988-1989 through 2003–2004. J Athl Train. 2007; 42:202–10.

[2] Borowoski LA, Yard EE, Fields SK, Comstock RD. The epidemiology of US high school basketball injuries, 2005–2007. Am J Sports Med. 2008; 36(12):2328–35.

[3] Clifton DR, Hertel J, Onate JA, Currie DW, Pierpoint LA, Wasserman EB, et al. The first decade of webbased sports injury surveillance: Descriptive epidemiology of injuries in US high school girls' basketball (2005–2006 through 2013–2014) and National Collegiate Athletic Association women's basketball (2004–2005 through 2013–2014). J Athl Train. 2018; 53(11):1037–48.

[4] Clifton DR, Onate JA, Hertel J, Pierpoint LA, Currie DW, Wasserman EB, et al. The first decade of web-based sports injury surveillance: descriptive epidemiology of injuries in US high school boys' basketball (2005–2006 through 2013–2014) and National Collegiate Athletic Association men's basketball (2004–2005 through 2013–2014). J Athl Train. 2018; 53(11):1037–48.

[5] Cumps E. Prospective epidemiologic study of basketball injuries during one competitive season: ankle sprains and overuse knee injuries. J Sports Sci Med. 2007; 6(2):204–8.

[6] DeHaven KE, Lintner DM. Athletic injuries: comparison by age, sport, and gender. Am J Sports Med. 1986; 14:218–24.

[7] Deitch JR, Starkey C, Walters SL, Moseley JB. Injury risk in professional basketball players: a comparison of Women's National Basketball Association and National Basketball Association athletes. Am J Sports Med. 2006; 34(7):1077–83.

[8] Dick R, Hertel J, Agel J, Grossman J, Marshall SW. Descriptive epidemiology of collegiate men's basketball injuries: NCAA Injury Surveillance System, 1988–1989 through 2003–2004. J Athl Train. 2007;42:194–201.18

[9] Drakos MC, Domb B, Starkey C, Callahan L, Allen AA. Injury in the NBA: a 17-year overview. Sports Health. 2010; 2(4):284–90.

[10] Ekhtiari S, Khan M, Burrus T, Madden K, Gagnier J, Rogowski JP, et al. Hip and groin injuries in professional basketball players: impact on playing career and quality of life after retirement. Sports Health. 2019; 11(3):218–22.

[11] Emery CA, Meeuwisse WH, McAllister JR. Survey of sport participation and sport injury in Calgary and area high schools. Clin J Sports Med. 2006; 16:20–6.

[12] Henry JH, Lareau B, Neigut D. The injury rate in professional basketball. Am J Sports Med. 1982; 10:16–8.

[13] Herzog MM, Mack CD, Dreyer NA, Wikstrom EA, Padua DA, Kocher MS, et al. Ankle sprains in the National Basketball Association: 2013–2014 through 2016–2017. Am J Sports Med. 2019; https://doi.org/10.1177/0363546519864678.

[14] Meeuwisse WH, Sellmer R, Hagel BE. Rates and risks of injury during intercollegiate basketball. Am J Sports Med. 2003; 31:379–85.

[15] Messina DF, Farney WC, DeLee JC. The incidence of injury in Texas high school basketball: a prospective study among male and female athletes. Am J Sports Med. 1999; 27:294–9.

[16] Powel JW, Dompier TP. Analysis of injury rates and treatment patters for time-loss and non-time-loss injuries among collegiate student-athletes. J Athl Train. 2004; 39:56–70.

[17] Rodas G, Bove T, Caparrós T, Langohr K, Medina D, Hamilton B, et al. Ankle sprain versus muscle strain injury in professional men's basketball: a 9-year prospective follow- up study. Orthop J Sports Med. 2019;7(6) https://doi.org/10.1177/2325967119849035.

[18] Smoljanovic T, Bojanic I, Hannafin JA, Hren D, Delimar D, Pecina M. Traumatic and overuse injuries among international elite junior rowers. Am J Sports Med. 2009; 37(6):1193–9.

[19] Starkey C. Injuries and illnesses in the NBA: a 10-year perspective. J Athl Train. 2000; 35:161–7.

[20] TrojianTH,Ragle RB. Injuries in women's basketball. Conn Med.2008; 72:147–50.

[21] Vinger, P., & Hoerner, E. (1986). Sports injuries. PSC Publishing Company.

[22] Zuckerman S, Wegner A, Roos K, Djoko A, Dompier T, Kerr Z. Injuries sustained in National Collegiate Athletic Association men's and women's basketball 19 2009/2010–2014/2015. Br J Sports Med. 2018; 52(4) https://doi.org/10.1136/bjsports- 2016-096005.

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