

# Common Sports Injury in Football Players: A Review

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## ABSTRACT

Football is the most popular sport worldwide, played by athletes of all ages, it is associated with a high injury rate. The injuries occur during football games and practice due to a combination of high speed and full contact. The authors of different studies showed in their results that the incidence of football injuries range from 0.5 to 45 injuries per 1000 hours of practice and games. Football injuries most commonly affect the knee and ankle joints, muscles, and ligaments of the thigh and calf. Most commonly affected region is lower extremity with an incidence of 61% to 90%. There are two types of risk factors intrinsic and extrinsic risk factors which are responsible for football injury. We found through this review of literature that ankle injuries are the most common injuries in football players. Other injuries which is also common in football players are such as, ligament of knee, hamstring strain, football concussion, wrist injury.

**Keywords:** Footballers, Sports injury, High speed, Injury incidence.

## INTRODUCTION

Football is the most popular sport worldwide, played by athletes of all ages, associated with a high level of injury. Injuries occur during football matches and practice because of a high-speed combination and full contact<sup>1</sup>. Football is also called the Soccer game where two team players 11 and 90 minutes of the game, the match is divided two 45 and a half minutes with a 15-minute break period. Football players use their body parts except their

hands and arms try to stop the ball into the opposing team's goal. In, football goalkeeper is only a player who can use the hand to handle the ball only in the penalty area around the goal. The cause of injury is around 80% traumatic injury and 20% overuse. Lower limbs are most commonly affected by ankle accounting up to one third of all injuries<sup>3</sup>. The ankle injury reaction includes a reduced level of physical activity and durability, and lost game time<sup>2</sup>.

## LOCATION AND NATURE OF INJURIES

Football injuries is most commonly affecting the knee, ankle joints muscles, and ligaments of the thigh and calf. Most commonly affected are the lower extremity 61% to 90%. In football, the most common type of injuries are contusions, sprains, and strains<sup>3</sup>. While Head injury occurs 4% to 24% of all football injuries<sup>3</sup>. All types of head injuries including facial fractures, lacerations, and eye injuries also found. It is caused by a direct blow to the head, face, neck, and player-to-player contact, acute Injuries occur during football games and practice due to the combination of high speed and full contact<sup>1</sup>. While, overuse injury can occur due to biomechanical abnormalities, decreased rest or faulty playing techniques<sup>2</sup>.

## INCIDENCE

The authors of different studies showed in their result that the incidence of football injuries range from 0.5 to 45

injuries per 1000 hours of practice and games. In adult male players, it happened about 12 to 35 injuries per 1000 hours of outdoor games and 1.5 to 7.6 injuries per 1000 hours of practice<sup>3</sup>. Common football injuries and their incidence are presented in table 1.

## COMMON INJURIES IN FOOTBALL

### Ankle sprains and ankle instability

An ankle sprain is a tear of one or more of the ligaments of the ankle partially or completely. The incidence of ankle sprain is highest in football players<sup>4</sup>. Ankle sprain is a common athletic injury and 80% to 100% ankle injuries are reported. Ankle sprains are also commonly found in some popular indoor recreational sports such as aero ball, wall climbing, indoor volleyball, mountaineering, netball and fields event<sup>5</sup>. The incidence of ankle injury is 77% due to lateral sprain and out of that 73% is due to the rupture and tear to the anterior talofibular ligaments. Ankle sprain occur when the strong ligament that support the ankle stretch beyond their limits and tear<sup>6</sup>. The anatomical location and mechanism of injury of ankle sprain are that the calcaneofibular ligaments CFL and posterior talofibular ligaments PTFL are less likely to sustain damaging loads, on the medial strong deltoid ligaments complex PTFL, tibial calcaneal TCL, talonavicular TNL and anterior tibiotalar ligaments ATTL is injured with forceful pronation and rotation movement of hindfoot<sup>7</sup>. The stabilizing ligaments of the distal tibiofibular syndesmosis are the anterior-inferior and transverse tibiofibular ligament<sup>6</sup>. High ankle sprain occurs with combined external rotation of the leg and dorsiflexion of the ankle. A lateral ankle sprain occurs during a rapid shift of body center of mass over the landing or weight-bearing foot<sup>7</sup>. The ankle rolls outward, the foot turns inward causing the lateral ligament to stretch and tear, A less common mechanism of ankle injury involves forceful eversion movement at the ankle injuring the strong deltoid ligament<sup>7</sup>. The interosseous membrane and ligament

and inferior transverse ligament several intrinsic and extrinsic factors predispose an athlete to chronic ankle instability<sup>6</sup>.

### Knee injuries

Knee injuries are also very common in football but their incidence is lower as compared to ankle injuries. The knee consists of two cruciate ligaments and two collateral ligaments<sup>8</sup>. Knee injuries one of the most common injuries is anterior cruciate ligament is most commonly affected in football players<sup>8</sup>. Usually occur in many sports such as basketball, soccer, handball, alpine skiing, and tennis<sup>9</sup>. Knee injuries have been reported as the most common of the severe lower extremity injuries more than 600000 injuries are identified every year<sup>10</sup>. Anterior cruciate ligament and medial collateral ligament injuries can occur when there is tension put on the knees, either twisting or turning action damaging knee ligaments or direct contact from another player can cause damage while tackling the football<sup>11</sup>. The annual prevalence of ACL injury was reported between 0.5 and 6.0% of all female football players and between 0.6 and 8.5% of all male football players<sup>12</sup>.

### Hamstring strain

Hamstring strain injury is also amongst common injuries in sports, causing loss of training and competition time, and affecting the quality of life of injured players<sup>13</sup>. This indicates a need to prevent this injury. Hamstring muscle injury also has a high reinjury rate<sup>13</sup>. A hamstring muscle strain injury is defined as thigh pain posteriorly, caused by indirect trauma to the contractile portion of the muscle<sup>14</sup>. It commonly occurs in the athletes of many popular sports in which high speed sprinting and kicking are frequently performed<sup>14</sup>. Many studies have also reported that the injury to the muscular strain of hamstrings occurred generally in many popular sports, such as skiing, alpine skiing, judo, cricket and bull<sup>13</sup>. A hamstring strain can be a pull, a partial tear, or a complete tear<sup>17</sup>. Muscle

strain is graded according to its severity. A grade 1 strain is mild and grade 3 is a complete tear of muscle belly<sup>15</sup>. Most common hamstring injuries occur in the thick central part of the muscle or where the muscle fiber joins tendon fibers<sup>15</sup>. Muscle overload is the main cause of hamstring muscle strain. It occurs when the muscle is stretched beyond its capacity or challenged with sudden load<sup>15</sup>. A muscle strain occurs when the muscle lengthens as it contracts or shortens<sup>14</sup>. Although it sounds contradictory, this happens when a person extends a knee joint while the muscle is weighted or loaded, this is called an eccentric contraction<sup>19</sup>. During sprinting in football while chasing the ball, the hamstring muscle contracts eccentrically as the back leg is straightened and the toes are used to push off and move forward<sup>15</sup>. The hamstring muscles are not only lengthened at this point in the stride but, also loaded with bodyweight as well as the force required for forwarding motion<sup>16</sup>.

### **Hip pointer**

The term "hip pointer," coined by Blazina in 1967, refers to an injury involving direct trauma to the iliac crest that causes a contusion or subperiosteal hematoma. Such injuries are common in collision sports<sup>17</sup>. Many muscles, including abdominal muscles, adhere to this site. A pointer can involve injury to the bone and or any soft tissue<sup>17</sup>. The hip pointers are caused by a straight hit to the bone part of the pelvis<sup>18</sup>. Commonly occurs in football or hockey when another player's helmet reaches pelvis. It can also occur by taking a hard fall onto the hip in any sport<sup>18</sup>. The typical hip pointer injury is characterized by localized pain and severe palpable tenderness along with a variable distance of the iliac crest<sup>19</sup>. More serious variant of this injury, where the most severe pain during injury, pain and gentleness extended from the iliac crest to anterolateral abdominal wall.<sup>20</sup>

### **Groin strain**

A groin injury is one of the most common injuries in football and other sports such as hockey, soccer, calisthenics and cricket. The injuries in the hip of the groin are common in the athletic population, particularly in sports that require kicking, twisting, spins and rapid changes in acceleration and deceleration, such as football<sup>21</sup>. The most prevalent groin injury in sports is the strain of the adductor. In soccer players, an incidence rate of 10% to 18% for the lesion of the groin injury<sup>22</sup>. Sports-related lesions in this area have been reported by 5% to 9%<sup>22</sup>. The specific tendency for injuries between some sports, such as injuries, represents 2% to 5% of injuries induced by sports, a Greater risk of experiencing episodes of athletic groin pain<sup>23</sup>. According to Moscler and Holmich, 10% to 11% of all injuries are sprain around the worldwide Groin sprain also comprised 10% of all injuries<sup>25</sup>. Groin sprain was responsible for 43% of all the sprain<sup>24</sup>. According to Estwanik and Sloane, the incidence rate of groin pain was from 10 to 18 cases per 100 soccer players<sup>26</sup>. According to (Ekstrand and Gillquist) reported that in 2002, almost 9.5% of all male soccer players had groin sprain. According to (Walden, Ekstrand), the risk rate for such injuries between male soccer players is close to 0.81 injuries for 1000 hours of exercise<sup>27</sup>. The resulting local or general pain can arise from simple or multiple musculoskeletal structure<sup>28</sup>. The resulting pain is often a frustrating problem in people who are involved in activities sprinting rapid, acceleration and deceleration changes, such as football<sup>28</sup>. Groin injury in most cases can cause chronic disabilities in which muscle / tendon tension of the adductor muscles and other muscles crossing the hip region is the main cause of pain<sup>29</sup>.

### **Shoulder dislocation**

The prevalence of anterior glenohumeral instability has been reported as 2% 33. Posterior glenohumeral

Dislocations represent only 2% of shoulder dislocations, and its initial diagnosis is lost in more than 60% of cases<sup>30</sup>. The dislocation of Shoulder is a common lesion in contact sports, such as football and hockey, and in sports that can involve falls, such as skiing downhill, gymnastics and volleyball<sup>30</sup>. The anterior Glenohumeral dislocation during sports activities or social life is one of the most frequent pathologies in the clinical practice of orthopedic traumatology<sup>30</sup>. The Glenohumeral joint is the most commonly dislocated synovial joint of the human body, forced abduction and external shoulder rotation can cause an anterior dislocation resulting in instability<sup>31</sup>. Posterior shoulder dislocations are the result of the axial load of the arm adducted and rotated internally, the violent muscle contractions resulting from seizure or electrocution, or a direct posterior force applied to the anterior shoulder<sup>33</sup>. The lesions associated with posterior shoulder dislocations include fractures of the posterior edge of the glenoid, the humeral axis, the head and the tuberosities<sup>32</sup>. The avulsion of the lesser tuberosity occurs as a result of the extreme tension supported by the subscapularis at the time of the dislocation<sup>34</sup>. The compression fractures of the anteromedial humeral head were called "Hill-Sachs lesions" result of the impaction of the humeral head on the posterior glenoid rim<sup>34</sup>.

### **Wrist and hand injury**

Scaphoid fractures are the most commonly injured carpal bone with a high incidence in university football, one with a high incidence in soccer players, and an increasing incidence in female athletes<sup>35</sup>. This hyperextension wrist injury tends to occur in a hand pronated and diverted radially<sup>35</sup>. The instability of the wrist commonly occurs in a spectrum of severity in hyperextension lesions<sup>36</sup>. Contact sports such as football or rugby, commonly place the athlete in an impact position with hyperextension, cubital deviation and supination of the wrist that can lead to these

lesions, due to the proximity of the structures in the wrist<sup>36</sup>. A breakdown of the incidence by sport is as follows: roller hockey, 30%; Baseball, 25%; Boxing, 17%; Basketball, 17%; volleyball, 13%; lifting weights, 13%; Ice hockey, 12%; Wrestling, 7%; and judo, 6%. The collateral ligaments of (UCL) thumb lesions are extremely common and, often, are seen in skiing, basketball and football<sup>37</sup>. The lesion occurs from an abduction movement on the thumb metacarpophalangeal joint (MCPJ), as a fall in an extended hand with the abducted thumb<sup>37</sup>. An Acute thumb lesion UCL has nicknamed the thumb of a skier in Contrast with chronic ligament insufficiency that is referred to as the gamekeeper thumb<sup>38</sup>.

### **Shin splints**

Shin splints occur when calf muscles repeatedly pull on the inside of the shin bone. This causes the muscles inflamed and swell<sup>39</sup>. Many different causes can be blamed, including adjusted or weak calf muscles, worn or incorrectly adjusted operating shoes, or soccer boots<sup>39</sup>. Other causes may include too much training that is carried out on hard surfaces where the greatest shock is applied to the body or in a change in the training load or in the types of exercises carried out<sup>40</sup>.

### **Football concussion**

The concussion is one of the most common injuries in football. Soccer has the highest rate of brain shocks that occur by 10,000 athletic exhibitions<sup>3</sup>. A concussion can be caused by several different biomechanical lesions, including a blow on the face, neck or head and collision with another player, can result from any blow that transmits a force to the head<sup>41</sup>. A concussion occurs due to a traumatic impact. Some important signs of concussion are headache, dizziness, nausea, drowsiness, loss of balance, numbness, blurred vision and difficulty concentrating. Cerebral shocks can be a very serious injury in football<sup>41</sup>.

**Table 1: Common Football injuries and their incidence**

Study	Population	football injuries	Percentage of injury
Hägglund et al., 2011	American young adult Football players	Knee joint	23%
Liu et al., 2012	Australian football players	hamstring muscle strain	30%
Walls et al.,2016	Elite soccer players	Ankle injuries	64%
Rothenberg et al.,2016	American Football players	knee injuries ACL injuries MCL injuries PCL injuries	14.2% 23% 33- 40%
Maffey and Emery, 2007	Australian football players	groin injury	5.17%
Walden et al.,2015	Senior football players and both sexes	groin injury	In males: 41-19% In females:2-14%
Gibbs et al.,2015	American football players	shoulder instability posterior instability anterior instability	10% 4% 34%
Carlisle et al.,2008	American football players	Wrist injuries	30%
Pellman et al.,2004	national football players	Football concussion	67.7%

## CAUSES OF FOOTBALL INJURIES

There are two types of risk factors, intrinsic and extrinsic risk factors that are responsible for football injury<sup>3</sup>. Intrinsic risk factors (related to the person) are related to the individual biological or psychosocial characteristics of a person such as muscle strength, joint instability, muscle weakness, asymmetry, prior injury, adequacy of rehabilitation and the Psychosocial stress<sup>42</sup>. Extrinsic risk factors (related to the environment) related to environments such as game level of game exercises (amount of competition and practice) Amount and training Error position that is played equipment such as shin guards, taping, and shoes playing field rules and foul play. Age is also a factor that causes a soccer injury<sup>42</sup>.

### Joint instability

The instability of the shoulder is one of the most common problems in soccer players, with a prevalence of 10% to 14%. There is a high recurring dislocation rate with mechanical and functional instability<sup>43</sup>. In football, more knee injuries occurred with medial instability and ankle sprain is also common due to a high volume of execution by players<sup>43</sup>.

### Muscle strength, tightness, and asymmetry

In soccer players, muscle strength is an important component of physical fitness in football<sup>3</sup>. The tests of the force of the lower extremities are very important because the muscle groups (quadriceps, the hamstring,

the rectus femoris calves) play a very important role to generate and absorb high forces during acceleration, the slowdown, the jump, the Kick, the return, the approach, the execution of direction changes and other movement activities during the football match<sup>3</sup>. In soccer players, muscle weakness, tension, muscle pain, muscle cramps, muscle tension, muscle contusion, acute injury and excessive use, is very common during the football match<sup>3</sup>. Football is a sport of resistance with repetitive complex movement sequences, as well as a high risk of bodily injury. The frequency of injuries between adult male players is high with most injuries that occur in the lower extremities (especially ACL)<sup>44</sup>. The mechanics of the lumbar-pelvic-hip complex and the thoracolumbar fascia, the players in the transfer of loads between the lower and higher extremities, the spine and the pelvis<sup>45</sup>. The pelvic asymmetries in the measurements of the posture can occur from injury at the lower extremities<sup>45</sup>.

### Body mechanics

In football, the correct biomechanics provides an efficient movement and can reduce the risk of lesions in soccer players. In football, incorrect technique can cause abnormal biomechanics during soccer matches that can increase the high risk of injury<sup>3</sup>.

### Psychological factors

In sports, there are physical challenges, such as intense training and

injuries that can lead to psychological challenges in soccer players as cognitive and emotional behavior. Players also have to deal with personal challenges, such as relationships or events of traumatic life<sup>46</sup>. These factors also affect the performance and training of the player. According to the judge, the stress of the event of life increases the risk of sports injuries.

### **Previous injury and rehabilitation**

Previous injuries and inadequate rehabilitation are the most important and intrinsic risk factors for future lesions in soccer players<sup>3</sup>. According to Nielsen and YDE (1989) reported that in 42% of injured players there had been an injury of the same type and location during the previous year. In soccer players, 30% of sprains and strains were reinjuries of the same type and location. Complete rehabilitation, proprioceptive training is used to minimize the possibilities of reinjuries<sup>47</sup>.

### **Level of play and position on the field**

In football, 11 players on a team are a goalkeeper and ten outfield players, which are defensive, the center of the field and the attack position<sup>3</sup>s. The goalkeeper is the most defensive position in the main work of football to stop the objectives of the opposition. The goalkeeper is the only player who used his hand during the football game<sup>48</sup>.

### **Amount and standards training**

In football, high intensity training is required to reduce the possibility of injury, during the previous season and regular season, players train up to 30 hours per week<sup>3</sup>. Training of Soccer Player Standards as Aerobic Resistance Training in Soccer, Interval Training, Pilot Set, Game Simulations, Soccer Circuits, Repeated Racing, Speed & Agility, Fast Training, Strength Training, Training Flexibility in football-static flexibility, dynamic flexibility, improve flexibility, ways to improve flexibility are used to train soccer

players and increase the capacity and strength of soccer players<sup>49</sup>.

### **Equipment in football**

The protection equipment is used to reduce sports injury that included helmets, shoulder pads, hip pads, thigh pads, knee pads, mouthpiece, jockstrap, cup, gloves and protective equipment that help prevent serious injury during the football match<sup>50</sup>.

### **Pitch condition**

In football 24% injury are recorded due to unsatisfactory pitches, most common injuries occur in football players due to a combination of poor surface and other factors like muscle tightness, joint instability, poor quality shoes, inadequate rehabilitation, dehydration<sup>3</sup>.

### **Rules and fair play**

The most common mechanism of injury in football is direct contact with another player, 44% to 74% of injuries are traumatic injuries which are known as collision injuries. 80% injury is ankle injury which occurs when a player addresses the football<sup>3</sup>.

### **PREVENTION**

The FIFA 11+ injury prevention program was developed in 2006 to avoid a football injury. football is a high-energy sport. Repetitive nature and high impact of sports can cause a variety of different football injuries<sup>3</sup>. To avoid an injury in football, adequate preparation for the game, maintain fitness, heating and stretching, cooling and stretching, moisturizer, suitable equipment is one of the most important factors that reduce risk of injury in football (helmet, shoulder, hip. pads, cola pads, knee pads, thigh guards, mouth protector, shoes)<sup>51</sup>. FIFA 11 includes 15 structured exercises; The exercises consist of the stabilization of the proprioceptive training of muscle training of the eccentric thigh, the dynamic stabilization and the plyometric exercises, all carried out with the appropriate postural alignment<sup>51</sup>. The program consists of a

complete warming procedure aimed at the prevention of injuries in football players<sup>51</sup>.

## CONCLUSION

This review study highlights recent injuries which are most common in football players. The most common injuries found through this literature review are ankle sprain, ligaments tears of the knee, groin injury, hamstring, strain, shin splints, rotator cuff injury, dislocation, fracture, Achilles' tendon rupture. These occur due to inappropriate surfaces, training errors, incorrect warm-up or stretching practice before a sporting event, and cool-down phase. The common mechanism of injury is contact injury player to player contact and non-contact injury. Such errors in the training should be avoided to prevent injuries.

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