

**Risk Factors for Injuries in Football (Arnason, Gudmundsson, Holme, Engebretsen, Bahr, 1999)**

Football players are more likely to get injured compared to other sports due to the characteristic of this sport which requires a lot of physical contact between each player. Study on risk factors for injury is important as it can be used to develop training styles or rehabilitation.

The researchers invited 20 male football teams in the 2 highest division season 1999 of Iceland Football league to participate in this study. The coach of each team selected his best 18 players to participate in this study (total of 306 participants). The players have to answer a questionnaire about their past and recurrent injury and take 6 physical tests in order to gather necessary information. The factors included in this study are age, body size, body composition, range of motion (ROM), power, jumping ability, peak O<sub>2</sub> uptake, ankle or knee instability, and previous injury. Also, the coach and staff of each team have to record if there's any injury in the team. The study uses a multivariate model to find the contribution of each factor and identify interrelationship among factors.

Test reliability has been analyzed as the group average CV percentage for paired measurement. The result of injury incidence is shown in the form of number of injuries per 1,000 matches or training hour. While the difference in injury rate between the highest league and lower league is measured by Z-Test which  $Z = \frac{(d1/t1) - (d2/t2)}{\sqrt{(d2/t2^2)}}$ , and d1 and d2 represent the number of injuries in the highest division and lower division respectively, while t1 and t2 are the exposure time in the two divisions. Also, categorical analysis is used as it separates players into 3 groups: The OR and 95 CI were applied to group players which are lowest, intermediate (reference group), highest for each variable.

From the study, 56% of players have got at least one injury during the season (4 months) and the total number of injuries are 244 injuries. To look deeper, 39% are minor injuries (1-7 days), 38% are moderate injuries (8-21 days) and 23% are severe injuries (more than 21 days). Also, the significant risk factors are age ( $P < 0.001$ ) and previous injury ( $P < 0.001$ ). While the 1 type that players get injured to most are muscle strains which occurred 73% of total injury. For the location, The thigh, knee, groin, lower leg, and ankle are the most frequent injury locations respectively.

The paper also provides practical suggestions to prevent the injury. The first suggestion is that the team should invest in physical therapists more as most of them are rarely present in the training. Also, using tape to cure the injury is important because it can cure the injury very well. Lastly, do not let the players return to the field too early because it causes future reinjury.

Overall, this study is well conducted, it explains each method in the ways that people can understand easily. However, there are some constraints such as limitation of staff participation which causes an underestimation in recording the number of injuries. Also, only 50% of participants completed all the tests as it takes time and distance to go to complete the test which lead to the decline in accuracy of multivariate tests.