# SURVEILLANCE OF MEDIA-BASED STUDIES ON FOOTBALL-RELATED INJURY CHARACTERISTICS, PREVENTION, EDUCATION AND MANAGEMENT

## *VIGILÂNCIA DE ESTUDOS BASEADOS NA MÍDIA SOBRE CARACTERÍSTICAS DE LESÕES RELACIONADAS AO FUTEBOL, PREVENÇÃO, EDUCAÇÃO E MANEJO*

## *VIGILANCIA DE ESTUDIOS MEDIÁTICOS SOBRE LAS CARACTERÍSTICAS, PREVENCIÓN, EDUCACIÓN Y GESTIÓN DE LESIONES RELACIONADAS CON EL FÚTBOL*

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**ABSTRACT**: The significance of football in promoting health and physical wellbeing has been well described. However, football-related injuries are viewed as professional hazards. Thus, research has specified the need for valid conclusions to provide useful information for the prevention and management of football-related injuries. Several imperial analyses of football injuries have been conducted with different designs and dimensions, including media-based analysis as a growing approach. Therefore, this paper reviews media-based studies on football-related injury types, locations, and mechanisms. The outcomes of this review showed that lower extremities, such as knee, ankle, and hamstring, are the most common injuries sustained by football players. Additionally, this review demonstrated that strikers are more prone to injuries compared with midfielders, goalkeepers, and defenders. Interestingly, the findings of media-based studies of football-related injuries concur with most experimental analyses. It was envisaged that valuable conclusions could be drawn to help manage and prevent football-related injury occurrences.

**KEYWORDS**: Football. Injury management. Education. Injury prevention. Sports news.

***RESUMO:*** *A importância do futebol na promoção da saúde e bem-estar físico foi bem descrita. No entanto, as lesões relacionadas ao futebol são vistas como riscos profissionais. Assim, a pesquisa especificou a necessidade de conclusões válidas para fornecer informações*

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*úteis para a prevenção e manejo de lesões relacionadas ao futebol. Diversas análises imperiais de lesões no futebol foram conduzidas com diferentes designs e dimensões, incluindo a análise baseada na mídia como uma abordagem crescente. Portanto, este artigo revisa estudos baseados na mídia sobre tipos, localizações e mecanismos de lesões relacionadas ao futebol. Os resultados desta revisão mostraram que as extremidades inferiores, como joelho, tornozelo e isquiotibiais, são as lesões mais comuns sofridas por jogadores de futebol. Além disso, esta revisão demonstrou que os atacantes são mais propensos a lesões em comparação com os meio-campistas, goleiros e defensores. Curiosamente, as descobertas de estudos baseados na mídia sobre lesões relacionadas ao futebol concordam com a maioria das análises experimentais. Imaginou-se que conclusões valiosas poderiam ser tiradas para ajudar a manejar e prevenir ocorrências de lesões relacionadas ao futebol.*

***PALAVRAS-CHAVE:*** *Futebol. Manejo de lesões. Educação. Prevenção de lesões. Notícias esportivas.*

***RESUMEN:*** *Se ha descrito bien la importancia del fútbol para promover la salud y el bienestar físico. Sin embargo, las lesiones relacionadas con el fútbol se consideran riesgos profesionales. Por lo tanto, la investigación ha especificado la necesidad de conclusiones válidas que proporcionen información útil para la prevención y el tratamiento de las lesiones relacionadas con el fútbol. Se han realizado varios análisis imperiales de las lesiones en el fútbol con diferentes diseños y dimensiones, incluido el análisis basado en los medios como un enfoque cada vez mayor. Por lo tanto, este artículo revisa estudios basados en los medios de comunicación sobre tipos, ubicaciones y mecanismos de lesiones relacionadas con el fútbol. Los resultados de esta revisión mostraron que las extremidades inferiores, como la rodilla, el tobillo y el tendón de la corva, son las lesiones más frecuentes que sufren los jugadores de fútbol. Además, esta revisión demostró que los delanteros son más propensos a lesionarse en comparación con los mediocampistas, porteros y defensores. Curiosamente, los resultados de los estudios basados en los medios de comunicación sobre las lesiones relacionadas con el fútbol coinciden con la mayoría de los análisis experimentales. Se preveía que podrían extraerse conclusiones valiosas para ayudar a gestionar y prevenir las lesiones relacionadas con el fútbol.*

***PALABRAS CLAVE:*** *Fútbol. Manejo de lesiones. Educación. Prevención de lesiones. Noticias deportivas.*

## Introduction

Football is recognized as the most popular sport globally (SVENSSON *et al.,* 2016) with a lot of benefits, including health promotion and physical wellbeing (ABDULLAH *et al.,* 2016; FORTINGTON *et al.,* 2018). However, despite the significance of football, football-related injuries are viewed as professional hazards (JUNGE *et al.*, 2004). Research has demonstrated that understanding the characteristics of football-related injuries could help develop management and prevention strategies (FINCH *et al.,* 2017; JUNGE *et al.,* 2004).

According to Junge *et al.* (2004), inquiry into football-related injuries could enable health professionals to observe their long-term changes as well as occurrences and dimensions. In essence, an understanding of the characteristics and occurrences of football-related injuries is important in designing and developing prevention and management strategies (OWOEYE *et al.*, 2017).

Increased demands for players to perform excellently result in an escalation of irregular football-related injuries (ASPERTI *et al.*, 2017). Thus, reliable information must be provided to help manage and prevent football injuries. Specifically, the provision of reliable information could streamline the understanding of football injury occurrences and mechanisms, and in turn, will prompt stakeholders to plan for appropriate actions. Hence, to manage and prevent football-related injuries, there is a need to obtain relevant and useful data specifying the characteristics of such incidences. In addition, administrators are gradually worried about being held accountable for the safety and well-being of football players (ANDERSON; KIAN, 2012). Given the significance of football in health promotion and physical wellbeing (FORTINGTON *et al.*, 2018), adequate analysis of injury patterns and trends is necessary (FORTINGTON; FINCH, 2016; MUSA *et al.*,2019).

Media content provides timely as well as reliable data on football injuries, which can help stakeholders in decision-making, especially before or after competitions (MUSA *et al.*, 2019). Once football injuries occur, they are likely to be reported as newsworthy events. Almost all media outlets dedicate considerable information and news content to professional sports. A such, media content advances the knowledge of medical staff, coaches, football players, and team managers on injury risk factors in football (HASSAN *et al.*,2020). Thus, media content can be a robust source of data for football-related injury analysis (BERCHIALLA *et al.*, 2012).

Previous studies have investigated football-related injury prevalence using varying study designs (*e.g.* AZUBUIKE; OKOJIE, 2009; BABWAH, 2009; EIRALE *et al.*, 2013; HÄGGLUND, 2007; KERR *et al.*, 2016; OWOEYE *et al.*, 2017). Some studies have specifically focused on the media-based analysis of football injuries (*e.g.* HASSAN *et al.*, 2020; LEVENTER *et al.*, 2016; FORTINGTON *et al.*, 2018; MUSA *et al.*, 2019). These studies stressed the importance of media content in providing timely and readily available injury data. However, little is known on how football-related injuries can be obtained from media content. Therefore, via a review of previous studies, this paper aims to identify football-related injury locations, types, and mechanisms.

## Methodology

The method of this research is descriptive. In which researchers collected material through documents and studies and writings and media. In this article, in order to work properly and make more use of the materials, first they were classified and then the related materials were extracted and finally the materials related to the research objectives were examined. The authors then extracted the material and the relevant results were extracted.

## Results

### Injury Types and Prevalence in Football

Several studies have investigated injury occurrences and characteristics in football (*e.g.* CONSTANTINOU, 2010; EIRALE *et al.*, 2013; HRYSOMALLIS, 2013; KERR *et al.*, 2016; MALLO *et al.*, 2011; SCASE *et al.*, 2012; WALDÉN HÄGGLUND; EKSTRAND, 2005; BABWAH, 2009). These studies focused on the analysis of football injuries at different competition levels, such as national and international tournaments, with varying designs and populations. For instance, Babwah (2009) used a retrospective method to examine football injury types and occurrences at a team level in Trinidad and Tobago. The study identified a total of 50 major football-related injuries. Similarly, Eirale *et al.* (2013) conducted a prospective cohort study to determine injury locations in football players at a team level in Qatar. The study recorded a total of 217 injuries of which one-third involved muscle strains. Additionally, a prospective cohort analysis discovered a total of 4483 injuries in 23 professional football teams in Europe (EKSTRAND; HÄGGLUND; WALDÉN, 2011).

Moreover, Mallo *et al.* (2011) examined injury incidents in Spanish sub-elite football teams during four consecutive competition seasons. The study found that injury incidents among football players amounted to 88%. Afterward, Murphy, O'Malley, Gissane and Blake (2012) employed an epidemiology approach to describe the presence and nature of injuries among football players over four sequential competition seasons (2007-2010) in the national sport of Ireland. The study identified a total of 1014 football-related injuries with hamstring as the most commonly affected location. Also, Waldén *et al.* (2005) examined injury characteristics in 14 Swedish football teams using a prospective design. The study found that thigh strain was the most commonly affected location, whereas knee sprain was the most common major injury.

Furthermore, lower extremities were found to be the most affected locations in football players (AGEL *et al.*, 2007; WONG; HONG, 2005). This evidence was further substantiated by Azubuike and Okojie (2009) who used a cross-sectional survey to investigate the causes and effects of football-related injuries among 196 players from seven Nigerian teams. Altogether, 204 football injuries were identified with ankle and knee as the most commonly affected locations. Owoeye *et al.* (2017) further used a prospective design to assess injury occurrences and patterns in 756 semi-professional football players from 22 Nigerian teams. According to the study, the injury occurrences among semi-professional players in Nigerian football teams is generally high. According to the study, lower extremities, lower leg contusion as well as knee sprain were the most common precise injury types.

Similar studies drew comparisons from different countries. For instance, Waldén *et al.* (2005) employed a prospective method to examine injury occurrences in professional football players, particularly in Sweden and Denmark. Based on the findings, football injuries in the selected countries share similar characteristics based on types and location. A study also explored regional differences in football injury occurrences among professional players in Europe (WALDÉN *et al.*, 2013). The authors conducted a nine-season prospective cohort analysis between 2001-2002 and 2009-2010 with 1357 players in 25 teams from nine countries. The findings showed that north European teams had higher injury occurrences compared to southern teams.

At the level of international tournaments, Junge and Dvorak (2013) examined football-related injuries during the tournaments organized by Fédération Internationale de Football Association (FIFA) and Olympic Games from 1998 to 2012. Overall, 3944 football injuries were identified in a total of 1546 matches. According to the findings, the ankle, lower leg, and head/neck were the most common injury locations. The study recommended strict application of football guidelines as a means of injury prevention. Additionally, Wilson, Caffrey, King, Casey and Gissane (2007) utilized interviews to explore football-related injury incidents among 83 players in three counties. According to the study, more football injuries occurred during matches compared to training with the ankle as the most commonly injured location. This outcome concurs with Morgan and Oberlander (2001) who found that football "injuries occurred more often during a game than during practice" (p. 428).

At the level of national tournaments, Orchard and Seward (2002) conducted epidemiology of football injuries over four seasons during the Australian Football League (AFL). The study showed that the most prevalent injury was hamstring strain, followed by anterior cruciate ligament and groin injuries. Likewise, Scase *et al.* (2012) used a longitudinal

cohort design to examine football-related injury occurrences among junior elite players during the Australian Football competition. The study identified 256 football injuries during the competition. It was found that the ankle joint was the most commonly affected injury location during the season. Further, Hrysomallis (2013) enumerated injury occurrences in competitions organized by Australian Rules Football (ARF) and found that hamstrings, ankle, and concussion occurred most frequently.

At the institutional level, Kerr *et al.* (2016) used a cross-sectional survey to examine injury proportions among high school football players. Football injuries, according to the study, occurred more frequently among full-time college employees compared with part-time employees. Similarly, another study combined retrospective and prospective methods to investigate injury surveillance data during fall and spring school practices (ALBRIGHT *et al.*, 2004). Altogether, 1007 spring injuries and 3950 fall injuries were identified using the retrospective method, whereas 648 spring injuries and 1502 fall injuries were recovered in the prospective study. Adickes and Stuart (2004) also found that injury prevalence was lower in youth players compared with adult players. According to the study, the knee ankle, wrist, and hand were the most commonly affected sites. In summary, previous studies proved that football-related injuries occur more frequently in the lower extremity compared with the upper extremity. Besides, analysis of football injuries is viewed as a prerequisite for the prevention and management of injuries among football players (WILSON *et al.*, 2007; JUNGE; DVORAK, 2013).

**Table 1 -** Summary of injury prevalence from mainstream studies

| Description | Type (Affected locations) | Empirical evidence |
|---|---|---|
| Most affected locations | Ankle | Adickes & Stuart (2004)<br>Azubuike & Okojie (2009)<br>Hrysomallis (2013)<br>Junge & Dvorak (2013)<br>Scase *et al.* (2012) |
| | Knee sprain | Adickes & Stuart (2004)<br>Owoeye *et al.* (2017)<br>Waldén *et al.* (2005) |
| | Hamstring strain | Hrysomallis (2013)<br>Murphy *et al.* (2012)<br>Orchard & Seward (2002) |
| | Leg | Junge & Dvorak (2013) |
| | Leg contusion | Owoeye *et al.* (2017) |
| | Thigh strain | Waldén *et al.* (2005) |
| | Head/neck | Junge & Dvorak (2013) |
| | Wrist | Adickes & Stuart (2004) |
| | Hand | Adickes & Stuart (2004) |
| | Concussion | Hrysomallis (2013) |

| | | |
|---|---|---|
| | Muscle strains | Eirale *et al.* (2013) |
| | Groin | Orchard & Seward (2002) |
| | Anterior cruciate ligament | Orchard & Seward (2002) |
| Affected players | Midfielders | Oberlander (2001) |
| | Defenders | Abdullah *et al.* (2016) |
| Time of occurrence | During matches/competitions | Junge & Dvorak (2013), Oberlander (2001) |

Source: Prepared by the authors

## Media-based Analysis of Football-related Injuries

Several media-based analyses of football-related injuries with various designs and dimensions have been published recently (e.g. BEAUDOUIN *et al.*, 2019; FORTINGTON *et al.*, 2018; HASSAN *et al.*, 2020; LEVENTER *et al.*, 2016; MUSA *et al.*, 2019; SCHIFFNER *et al.*, 2018). These studies have examined various characteristics of football injuries, such as types, locations, and intensities of injuries. Some studies focused solely on media-based analysis, while others combined media-generated datasets with retrospective analysis. For instance, Fortington *et al.* (2018) employed a media-based method to analyze football-related fatalities from the Australian news media content. A total of 34 football fatalities were identified. Likewise, Anderson and Kian (2012) explored concussions among football players in the US via media-based analysis. According to the study, media content consists of a wealth of health-related information that can help health professionals to promote football players' long-term fitness.

Additionally, Leventer *et al.* (2016) used public media content to describe injury types, severity, and localization in German football players. The study found that injuries occurred most frequently in sprains and strains, while forwards sustained considerably higher injury rates compared with wing-defenders. The highest injury rates occurred among central-defenders during training periods while high injury rates occurred in wing-midfielders during matches. Another study used media-based data to investigate injury occurrence in professional German football players during the two seasons of the German football league from 2007-2008 as well as 2016-2017 (KRUTSCH *et al.*, 2019). A total of 57 major ACL ruptures were identified, while six recurrent football-related injuries were found. More recently, via media content analysis, studies found that the knee was the most commonly reported football-related injury, followed by ankle and hamstring injuries (HASSAN *et al.*, 2020; MUSA *et al.*, 2019). According to Musa *et al.* (2019), strikers recorded the highest number of injuries, followed by midfielders, goalkeepers, and defenders.

Moreover, a study combined analysis of media-generated data with prospective cohort analysis (FÜNTEN *et al.*, 2014). The analysis primarily focused on injury characteristics in German football players from 2009 to 2010. The study found that high-competitive training and competition further caused an increase in the fatigue level of football players. Similarly, Beaudouin *et al.* (2019) conducted a retrospective study with additional data from media content to explore injury occurrences and mechanisms in professional male football players, particularly head injuries during German football competitions. The authors obtained football injury information from publicly available media content. According to the study, most head injuries occurred as a result of elbow-head and head-head contacts.

Schiffner *et al.* (2018) also identified injury lay-off and epidemiology after Anterior Cruciate Ligament Ruptures (ACLRs) among German professional male football players through media-based registers. The authors observed a varying number of ACLRs per season with goalkeepers having considerably less risk of sustaining an ACLR compared with outfield football players. The study also showed that knowledge of ACLR, injury mechanisms, and injury risk factors is necessary, particularly for medical staff, coaches, team managers, and football players. The results obtained from media content concurred with information gathered from the teams' medical professionals. Thus, media-based analysis of football injuries can be an alternative to retrospective or prospective studies.

**Table 2** - Summary of injury prevalence from media-based studies

| Description | Type (Affected locations) | Empirical evidence |
|---|---|---|
| Affected locations | Knee sprains | Leventer *et al.* (2016)<br>Hassan *et al.* (2020)<br>Musa *et al.* (2019) |
| | Ankle | Hassan *et al.* (2020)<br>Musa *et al.* (2019) |
| | Thigh strains | Leventer *et al.* (2016) |
| | Hamstring | Hassan *et al.* (2020)<br>Musa *et al.* (2019) |
| Affected players | Strikers | Musa *et al.* (2019) |
| | Midfielders | Leventer *et al.* (2016)<br>Musa *et al.* (2019) |
| | Central-defenders | Leventer *et al.* (2016)<br>Musa *et al.* (2019) |
| Time of occurrence | Matches | Leventer *et al.* (2016) |
| | Training | Leventer *et al.* (2016) |
| Media locality | Germany | (Beaudouin *et al.* (2019) Fünten *et al.* (2014)<br>Krutsch *et al.* (2019)<br>Leventer *et al.* (2016) Schiffner *et al.* (2018) |
| | Nigeria | Hassan *et al.* (2020)<br>Musa *et al.* (2019) |

| | | |
|---|---|---|
| | Australia | Fortington *et al.* (2018) |
| | United States | Anderson & Kian (2012) |

Source: Prepared by the authors

In summary, previous media-based studies demonstrated that lower extremities, such as knee, ankle, thigh, and hamstring, represent the most commonly affected locations. These findings are consistent with previous prospective and retrospective studies. Additionally, strikers are more prone to injuries compared with midfielders, goalkeepers, and defenders. This outcome suggests that media-based injury studies could provide medical practitioners, sports administrators, and athletes with valuable information for the effective management and prevention of football-related injuries. Further, the foregoing review suggests that most previous studies on the media-based analysis of football-related injuries were carried out in Germany (BEAUDOUIN *et al.*, 2019; FÜNTEN *et al.*, 2014; KRUTSCH *et al.*, 2019; LEVENTER *et al.*, 2016; SCHIFFNER *et al.*, 2018), Nigeria (HASSAN *et al.*, 2020; MUSA *et al.*, 2019), Australia (FORTINGTON *et al.*, 2018) and the US (ANDERSON; KIAN, 2012).

## Discussion and Conclusions

This paper provided a review of media-based studies on football-related injury types, locations, and mechanisms. The outcomes of this review suggest that lower extremities, such as knee, ankle, and hamstring, represent the most commonly affected locations. Interestingly, this review shows that the outcomes of media-based analyses of football-related injuries concur with most retrospective and prospective studies (CONSTANTINOU, 2010; EIRALE *et al.*, 2013; HÄGGLUND, 2007; JUNGE *et al.*, 2004; OWOEYE *et al.*, 2017). This consistency indicates the significance of media content in providing useful information on football-related injuries, which can be an alternative to findings from prospective or retrospective studies (SCHIFFNER *et al.*, 2018). The permanency, accessibility, and timeliness of the media content make it particularly valuable in studying football-related injuries.

In football, the lower extremities are mostly injured, especially during tackling where players respond quickly with unpredictable movements. Hence, lower extremities are likely to be exposed to acute or chronic injuries (AGEL *et al.*, 2007). The injury mechanisms showed that football players sustain more recurrent injuries than fresh. This outcome indicates that football players are highly exposed to injuries. Football games involve several technical and

tactical skills, such as twisting and turning, tackling, shooting, running, jumping, and landing. The execution of these skills is often challenging. If a player is unable to accomplish the skills properly, an injury often occurs (WONG; HONG, 2005).

Additionally, this review demonstrated that strikers are more prone to injuries compared with midfielders, goalkeepers, and defenders. Football-related injuries may occur irrespective of the players' positions. However, some players tend to sustain injuries more frequently than others. Strikers are expected to cover a long distance and perform several attempts to score goals (ABDULLAH *et al.*, 2016). As such, forwards are susceptible to a variety of injuries ranging from minor blows, major injuries to career-threatening. Nevertheless, Morgan and Oberlander (2001) found that midfielders were likewise reported to have a varying degree of injuries during football competitions. Likewise, defenders were also found to have a certain level of exposure to injury incidents because of their defensive role which involves several contacts with opposition players (ABDULLAH *et al.*, 2016).

Furthermore, injuries have certain physical and psychological effects on the performance of football players (AZUBUIKE; OKOJIE, 2017; SCHIFFNER *et al.*, 2018). Football-related injuries may also have significant economic impacts. According to Azubuike and Okojie (2017), governments spend a huge amount of money on the treatment, rehabilitation, and prevention of sports-related injuries. Thus, more empirical findings on football-related injuries can useful to governments and relevant agencies. This is because valid and accurate injury data could help design effective management and preventive measures. As explained earlier, ascertaining injury types and locations could help to design effective management and preventive strategies (LEVENTER *et al.*, 2016). Also, players' consciousness of the importance of fair play can help to prevent football-related injuries (JUNGE *et al.*, 2004).

The outcomes of this review advance our understanding of how media content can be used to conduct an empirical analysis of football-related injuries. In essence, previous studies have proven that media-based analysis can be an alternative to other methods such as prospective and retrospective analyses. Further, this review could guide medical practitioners, sports administrators, players, and relevant stakeholders to appropriate actions for the management and prevention of football-related injury occurrences. However, this review shows that most previous studies were confined to certain countries such as Australia, Germany, Nigeria, and the US. Given this limitation, media-based analysis of football-related injuries should be replicated.

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**How to reference this article**

HASSAN, I.; MUAZU MUSA, R.; IBRAHIM ABUBAKAR, U.; NAZRI LATIFF AZMI, M.; RAZALI ABDULLAH, M. Surveillance of media-based studies on football-related injury characteristics, prevention, education and management. **Revista online de Política e Gestão Educacional**, Araraquara, v. 26, n. esp. 1, e022024, Mar. 2022. e-ISSN: 1519-9029. DOI: https://doi.org/10.22633/rpge.v26iesp.1.16500

**Submitted**: 02/11/2021
**Required revisions**: 20/12/2021
**Approved**: 19/02/2022
**Published**: 31/03/2022