

INNOVATIVE RESEARCH IN SPORT SCIENCES



Editor

Assoc Prof. Mehmet DALKILIÇ, Ph.D,

DUVAR

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TABLE OF CONTENTS

Chapter 1.....5

Sports Industry Overview

Bahadır BAYARSLAN

Chapter 2.....21

Football Head Coaches (Managers) Stability

Bahadır BAYARSLAN

Chapter 3.....35

The Importance of Genetic Factors in Sports Injuries

Celal BULGAY, Veli Ozan ÇAKIR, Mehmet Ali ERGÜN

Chapter 1

Sports Industry Overview

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ABSTRACT

The sports industry is a sector that has great effects in various fields and is very complex to manage. Many factors must be managed simultaneously for success. These factors include areas such as management and marketing. In recent years, the sports sector has been growing rapidly, especially in the field of for-profit sports facilities. This growth is closely related to the commercialization of sports and the increase in marketing activities. Increasing demand and interest requires the operation of sports facilities with a more professional management approach and the implementation of various marketing strategies. Technology has become one of the most important factors driving the international competitiveness of the sports industry. Technology is prominent in a variety of contexts, including playing, consuming, and spectator experience in sports. Because of the inherent need for technology in sport, it becomes more important to understand how to develop a comprehensive strategy for innovation management.

Keywords: Sport Industry, Sport Mnagement, Sport Technology

ÖZET

Spor endüstrisi, çeşitli alanlarda büyük etkileri olan ve yönetilmesi oldukça karmaşık bir sektördür. Başarı için birçok faktörün aynı anda yönetilmesi gerekir. Bu faktörler yönetim ve pazarlama gibi alanları içerir. Son yıllarda spor sektörü, özellikle kâr amaçlı spor tesisleri alanında hızla büyümektedir. Bu büyüme sporun ticarileşmesi ve pazarlama faaliyetlerinin artmasıyla yakından ilgilidir. Artan talep ve ilgi, spor tesislerinin daha profesyonel bir yönetim anlayışıyla işletilmesini ve çeşitli pazarlama stratejilerinin uygulanmasını gerektirmektedir. Teknoloji, spor endüstrisinin uluslararası rekabet gücünü artıran en önemli faktörlerden biri haline geldi. Teknoloji, sporda oyun oynama, tüketme ve seyirci deneyimi gibi çeşitli bağlamlarda öne çıkıyor. Sporda teknolojiye olan doğal

ihtiyaç nedeniyle, inovasyon yönetimi için kapsamlı bir stratejinin nasıl geliştirileceğini anlamak daha önemli hale geliyor.

Anahtar Kelimeler: Spor Endüstrisi, Spor Yönetimi, Spor Teknolojisi

INTRODUCTION

The sports industry is a sector that has great effects in various fields and is very complex to manage. Many factors must be managed simultaneously for success. These factors include areas such as management and marketing. In recent years, the sports sector has been growing rapidly, especially in the field of for-profit sports facilities. This growth is closely related to the commercialization of sports and the increase in marketing activities. Increasing demand and interest requires the operation of sports facilities with a more professional management approach and the implementation of various marketing strategies. In this context, sports marketing is a holistic process carried out with a planned and strategic approach in order to meet the needs of sports consumers and to encourage them to prefer sports-related products and services (Yalçın and Yuktaş, 2004). Known as the four components of traditional marketing;

- Product
- Price
- Place
- Promotion

Their concept has now been expanded with three additional P's (7P) for more sophisticated customers.

These additional P's are;

- People
- Period
- Physical Environment

Together, these concepts make up the marketing mix.

Product

It consists of basic and complementary elements as services or goods. It should be designed to meet customer needs and exceed their expectations.

Price

The price of the product or service is determined by considering the income level of the customers and other user expenditures. At the same time, the company's income and profit targets are also taken into account.

Place and Time

Physical and non-physical channels are used for the distribution of the service or product. Appropriate location and timing strategies that provide access to customers are determined.

Promotion

Promotional and educational activities are carried out to provide information, persuade and teach customers how to use the service.

People

Relationships between staff, marketers and vendors interacting with customers and customer satisfaction are managed.

Period

It manages the ins and outs of marketers and vendors throughout the customer service process and ensures that the process works effectively.

Physical Environment

It deals with designing the service landscape and providing tangible evidence for service performance.

This 7P concept has been developed considering the changing customer needs and marketing dynamics of the age. Commercially successful sports facilities attach great importance to marketing activities in order to attract large masses, to make effective advertisement and promotion, to ensure customer satisfaction with the services they provide and to stay in a competitive position. This process contributes to making sports accessible and interesting to wider audiences. The harmonious management of these components enables to create a successful marketing strategy by increasing customer satisfaction (Karakuş, 2023).

Sports Concept

When we say sports, we think of an environment that brings different people closer together, creates a common excitement, and makes people experience many different emotions such as competition, entertainment, competition, victory and defeat at the same time.

No location or part of human relations can be shown other than stadiums and sports events so that people can easily understand that they have so much in common there and that they can easily find a common language to speak regardless of their mother tongue.

Sports, both as "one of the most important social forces of the age" at the international level and as a "social institution" that touches the ground at the national level and takes root there, is sensitive to the social, economic, political, ideological, cultural etc. developments and balances of the environment in which it is performed.

Sport is a universal phenomenon that removes stereotypes such as social status, religion, language and lifestyle. Sport is not only a spectacle, but also a pastime that provides entertainment. Today, many people do sports to stay healthy and have fun. Sport emerges as a phenomenon with increasing effects on human life in today's consumer societies. From an individual point of view, it provides the development of physical abilities and mental abilities of individuals, and from a social point of view, it is known to strengthen people's social bonds.

However, the benefits of sports to society should not be evaluated only with the health they bring to people. Because if it is considered in terms of economic gain and employment, sports has become an industry branch today with sports facilities and companies producing sports equipment, tourism and professional clubs. However, the benefits of sports to society should not be evaluated only with the health they bring to people. Because if it is considered in terms of economic gain and employment, sports has become an industry branch today with sports facilities and companies producing sports equipment, tourism and professional clubs.

Sports Industry

In order to understand sports marketing, the sports industry must first be understood. The growth of sports-related businesses, companies producing sports goods, mass media, sports fields, stadiums, companies producing sports commercial products, athletes, professional and amateur leagues within the sports field has not only made sports an industry, but also provided sectoral growth within the industry. Within the sports industry, there are products, sports activities, recreation, fitness or leisure activities and related products and services. In addition, the fields of activity of businesses such as shopping places, restaurants, hotels, factories and bars are indirectly related to the sports industry.

According to the functions of sports marketing, if we classify the sports industry under the conditions of our country;

1. Those who provide games or sporting events to consumers or spectators
 - Professional individual sports
 - Stadiums, gyms
 - Race tracks
 - Professional team sports

2. Providers of services or equipment for participants and players
 - Companies providing commercial services

Innovative Research in Sport Sciences

- Companies producing sporting goods
- Clubs, resorts, marinas
- Amateur sports clubs
- School sports activities

3. Support, control and promotion of sports organizations - Sports federations and leagues

- Sports sponsors
- Sports media
- Management, research and consultancy groups

The sports industry is basically divided into 4 sectors:

- a. Manufacturers of sports goods such as sports facilities construction, sports equipment and fitness equipment,
- b. Manufacturers of sportswear, shoes and similar sportswear,
- c. Providers of sports services in health and fitness clubs
- d. Other revenue generating areas such as broadcasting rights, sponsorship deals, entry fees.

In the most general sense, the sports industry includes the following features:

- a) Presents a navigational product.
- b) Offers participatory products
- c) Provides necessary or needed equipment for sports and fitness activities.
- d) Offers promotional merchandise.
- e) Provides facilities where sportive events can be held.
- f) Provides necessary services for the continuation of sportive and recreational activities.
- g) Offers recreational activities.
- h) It includes the management and marketing of sports organizations.

- i) Presenting special sports magazines or other events offered by publishing companies.
- j) Providing opportunities for professional athletes to perform their financial, legal and promotional work.

The high number of viewers in stadiums and on TV, the increase in the number of readers who read sports news in newspapers and magazines have resulted in the use of sports fields for the promotion of another product. Today, sports has become one of the largest industries in the world, as it is a powerful communication channel. It is a strong field that can establish permanent and long-lasting bonds between brands and consumers, create loyalty and create an emotional bond. Watching sports events by large masses has caused companies operating in other sectors, apart from the sports sector, to turn to this field.

Sports Technology and Innovation

Technology is becoming one of the most important factors driving the international competitiveness of the sports industry. It seems to be on the agenda of most sports organizations due to the impact of technological innovations on performance. Innovation is defined as “the process of introducing and implementing new ideas, processes or procedures designed to significantly benefit the individual, group, organization or wider society” (Cabrilo & Dahms, 2018). Therefore, as a result of increased computing power, the way technology is used in sports has changed (Hutchins & Rowe, 2013). Most people have a smartphone, and it has changed the way they view and consume sports. In addition, the number of sports-related technology services has increased significantly in recent years (Kim & Ko, 2019). Advances in technologies continue to radically change the way sports are consumed (Szymanski, Wolfe, Danis, Lee, & Vy, 2020). In addition, human-computer interaction facilitates new ways of using technology in a sports environment (Kim, Chiu, & Chow, 2019).

This includes facilitating physical development by pushing the boundaries of sport.

Technological Innovations in Sports

Technological innovation in sport comes in a variety of forms, including planned and unplanned activities. This means that technology innovation can emerge from both an amateur and professional environment. Planned activities include sports and technology organizations working together on technology projects. Due to the worldwide consumption of sports, more attention has been given to how to conquer this market. Unplanned activities include casual and chance encounters with sports technology (Loland, 2002). Often sports technology innovations are invented in another industry sector and then translated in a sports environment or mean that advances in sports technology must be studied extensively to understand how they evolve based on market demand.

Sports Technologies Education and Entrepreneurship

Technology education in sport offers researchers, practitioners and policy makers certain advantages over other industry settings. In sports, it has been the frequent use of technology that has changed the strategic direction of the industry. This means that studies in sports technology can make a useful contribution to business development practices by focusing on different stages of the competitiveness process of sports (Pfister, 2001). Competitive sport goes through 3 main phases;

- Before the competition
- During the competition
- Includes post-competition time (Hudson et al., 2019)

Driven by the constant need for innovation, technology has impacted most parts of the sports industry. More and more sports businesses have been opened based on developments in digital technologies. Now, more emphasis is placed on the active use of objects, which means connecting internet-enabled devices in

sports, by integrating them with internet support. Due to this integrated state, it results in more sports digital business based on technology devices.

Factors Affecting the Development of Sports Industry

The sports industry is considered one of the most technological innovators due to the use of technology in many different ways (Riot & James, 2013). Technological innovations are an important part of the sports industry (Özsoy and Karakuş, 2023).

Numerical Increase of Different Sports and Recreation Activities

With the increase in the free time of individuals, participation in sports activities has also started to increase. Depending on the understanding of the importance of sports activities for a healthy life, participation in health-related activities has increased. As a result of this, the number of facilities such as sports centers, fitness centers and health clubs where these activities can be held has started to increase. The effect of women's participation in sports activities is also great in this increase.

Especially in the weekend television programs and the weekend supplements of the newspapers, the topics related to healthy life and the positive values that sports add to healthy life have increased the interest of women in this subject. The increase in women's participation in sports activities has created new segments in the market. The fact that companies such as Nike and Adidas offer women's special products is a good proof of this.

Increase in Mass Media

Dealing with technology can be a complex process given the time and costs associated with its implementation. Thus, sports technology can be analyzed from a multi-level perspective at the individual, community, organizational, inter-organizational, regional, national and international levels. At the individual level, athletes use technologies such as social media to connect with fans. The

increasing interest of the masses in sports causes sports events to take place more in mass media. Today, sports reach huge numbers in terms of viewing. Olympic races, World Championships and European Championships reach billions of people at the same time.

Increase in Individuals' Leisure Time

Regulations reducing the workforce of working individuals and technological, social and economic changes have facilitated the lives of individuals, and as a result, an increase in the leisure time of individuals has occurred. These individuals have turned to many different areas where they can spend their free time. Sports activities, recreational activities, which have the ability to appeal to different economic segments, have been the most important areas where individuals can spend their spare time. Sporting activities and recreational activities, which are differentiating and enriching day by day, have become an important part of human life. The need for socialization and healthy living of people makes these activities important.

Increase in Sports Products in Various Market Segments and Technological Developments Related to These Products

One of the reasons for the development of the sports industry is the increase in goods and services in the sports industry. Goods and services in the sports industry can be classified under four divisions:

- Sports products
- Sports and health services
- Sports training
- Sports technologies

The sports industry takes advantage of today's technology. Technology has affected sports equipment, sportswear and sports facilities. There are many different products in the market such as energy-giving drinks, shoes produced

separately for each sport, sweat-proof tracksuits. Sports products and services that appeal to different consumer groups were also designed and offered to consumers. Sports shoes for women, shoes designed for different sports branches, racquets or basketballs in different sizes, shapes and appearances, or shoes specially produced for children are examples.

Increasing Marketing Trends Within the Sports Industry

Previously, basketball games were played as two sides, but now they are played as four quarters. With the advertisements given during the breaks, the companies can easily reach the consumers. In particular, the advertisements given when slam dunks are very popular and these dunk moves are shown in slow motion, inevitably attract the attention of consumers. That is, the rules within the sport can be changed to make the sport more salable.

The sports industry offers incredible opportunities for sponsorship activities. Sports sponsorship, which is at the top of the sponsorship activities with a share of over 50%, whets the appetite of commercial companies. It is also logical that the marketing trends in this area are extremely high. The reasons why companies take part in sponsorship activities so intensely is that they want to increase their brand awareness, improve their image and increase the sales of their products/services.

The company logos we see on the jerseys of the athletes, the company advertisements on the field borders, the advertisements featuring the famous athletes, and the dozens of company names placed in the camera-visible part of the place where the press conference is held are proof of this. Cars covered with sponsor logos in "Formula 1" races or company logos that cover most of Formula 1 racers' jerseys are important examples in this regard.

Increasing Sports Education

Tennis and golf, which are called rich sports, are now being delivered to large masses of people. In particular, TRT's broadcasting of tennis tournaments has

increased the interest in tennis in our country. Even in the Eastern and Southeastern Anatolia Regions, tennis, golf and ski sports are now practiced. As people become aware of sports, they are willing to receive training on this subject. Since they can receive education through courses, a commercial field of activity emerges.

Profit Increase in Sports Industry

As sports have become a commercial activity and it is a profitable field, the competition in this field has increased considerably and the competition has brought quality.

Developments in Sports Management

Sports management is expressed as “using the functions of planning, organising, managing and evaluating within organizations whose primary goal is to provide sports-related activities, products and services”. The sports management program provides students with sports-related knowledge and skills in business management. For example, sports marketing , sports law, sports ethics can be given as examples.

CONCLUSION

The sports industry is increasingly influenced by technological innovations for global competitiveness. Technology is prominent in a variety of contexts, including playing, consuming, and spectator experience in sports. Because of the inherent need for technology in sport, it becomes more important to understand how to develop a comprehensive strategy for innovation management. Technology has become one of the most important factors driving the international competitiveness of the sports industry. Technology is prominent in a variety of contexts, including playing, consuming, and spectator experience in sports. Because of the inherent need for technology in sport, it becomes more important to understand how to develop a comprehensive strategy for innovation

management. The purpose of this article is to discuss the role of sports technology in both technology innovation and sports management literature by adopting an organizational learning approach. This helps to understand how information is managed in a sports context and how it contributes to the development of sports technology. In addition, the role of entrepreneurial ecosystems in the sports industry is discussed in order to understand the emergence of sports technology. The sports industry increasingly needs the use of technology to facilitate performance improvements. In addition, the role of entrepreneurial ecosystems in the sports industry is discussed in order to understand the emergence of sports technology.

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Chapter 2

Football Head Coaches (Managers) Stability

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ABSTRACT

Club owners can update their knowledge of head coach performance with the results of each match, which usually takes place at least once a week during the football season. This gives them the opportunity to evaluate Head Coach performance against expectations almost continuously; this is something more difficult to do where owners only get annual financial accounts and find it costly to monitor manager performance. Players may only be traded at certain times during the football season, while Head Coaches may be dismissed throughout the season and also during the off season between May and August. To get an impression of the potential determinants of a Coach's dismissal, the number of games up to and from his dismissal in a given season should be examined. During this period, it is expected that the gains for the club will be evaluated objectively, compared with the losses and put on the scales.

Keywords: Football, Manager, Coach, Stability

ÖZET

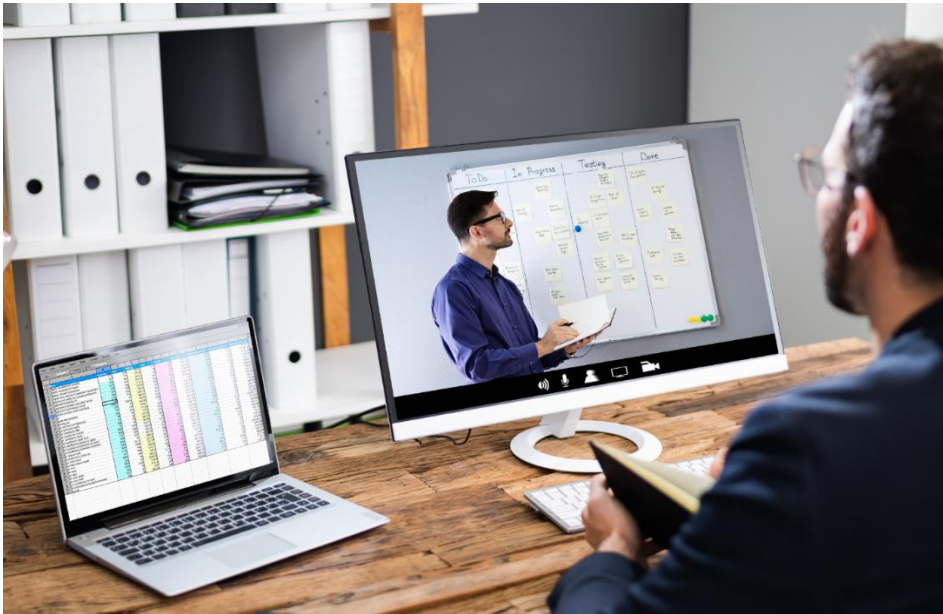
Kulüp sahipleri, genellikle futbol sezonunda haftada en az bir kez gerçekleşen her maçın sonuçlarıyla baş antrenör performansındaki bilgilerini güncelleyebilirler. Bu onlara, Baş Teknik direktör performansını beklentilere göre neredeyse sürekli olarak değerlendirme fırsatı sağlar; bu, sahiplerin yalnızca yıllık mali hesapları aldığı ve yönetici performansını izlemeyi maliyetli bulduğu durumlarda yapılması daha zor olan bir şeydir. Futbolcular sadece futbol sezonu boyunca belirli zamanlarda takas edilebilirken, Teknik direktörler sezon boyunca ve ayrıca Mayıs ve Ağustos ayları arasındaki kapalı sezonda işten çıkarılabilir. Teknik Direktörün görevden alınmasının potansiyel belirleyicileri hakkında bir izlenim edinmek için, belirli bir sezonda görevden alınmasına kadar olan maç sayısı ve görevinden alınmasına kadar geçen süre incelenmelidir. Bu süre içerisinde kulüp açısından kazanımlar objektif değerlendirilerek, kayıplar ile karşılaştırılarak teraziye konulması beklenilir.

Anahtar Kelimeler: Futbol, Teknik Direktör, Antrenör, İstikrar

INTRODUCTION

The relationship between leadership change and organizational performance has received great attention in recent years. A large body of work focuses on the causal effect of poor organizational performance on the likelihood of leaving.

When a company performs poorly or performs worse than expected, the CEO can expect to be under pressure to "turn things around", and if that doesn't happen, he or she may be threatened with layoff. The firm's poor performance may be directly related to the decisions or indecision of senior managers, or it may simply be "bad luck" as in worsening market conditions. Conversely, if one firm is performing very well, other firms take it as a sign of the CEO's high talent and try to kidnap the CEO. At the very least, the CEO can use good performance in on-the-job search to get a better job offer from another firm. While theoretically the threat of firing can be used by company owners to discipline managers, the empirical literature shows that until recently, managers were rarely explicitly fired for poor performance.



Club owners can update their knowledge of Head Coach performance with the results of each match, which usually takes place at least once a week during the football season. This gives them the opportunity to evaluate Head Coach performance against expectations almost continuously; this is something more difficult to do where owners only get annual financial accounts and find it costly to monitor manager performance. Players may only be traded at certain times during the football season, while Head Coaches may be fired or hired throughout the season, as well as during the off season between May and August. Head Coaches can also signal to potential employers how well they are doing on a weekly basis through the performance of their team, which is often attributed to the Head Coach. Prospective employers may therefore update their assessment of Head Coach quality on a weekly basis and try to miss out on opposing teams Head Coaches, creating strong incentives for well-performing Head Coaches to leave their current employer in favor of another employer, subject to negotiation.



Factors Affecting Success in Football Club

While revealing the factors that cause success in the teams, while considering the internal factors, namely the management structure of the club, the club's facilities, technical staff, and athletes; supporters, media organizations and competitors on the field are considered as external factors (Onağ et al., 2013).

The characteristics of the coach that affect success

The Turkish Football Federation (TFF) defined professional coaches as follows; "Technical men who have made a written contract with a club, are paid more than they have made within the scope of football activities, and have received a professional team license from the TFF" (TFF Technical Men's Status and Working Principles Instruction, 2009, p.1).

The duties of coaches regarding their athletes and clubs in general can be summarized as follows:

To train and improve the athletes by using their technical and tactical skills within the team.

To conduct various investigations and researches in order to ensure the continuity of the athletes or to increase the potential of the current athletes.

To assist athletes' versatile, physical-physiological, psychological and social development

To prevent injuries to athletes by taking all possible safety precautions.

Maintaining and improving the health of athletes on a regular basis

Making evaluations of the athletes periodically with measurements and tests by making the most suitable development for the team (Çalışkan and Göral, 2015).

Skills That an Ideal Coach Should Have

Communication

A coach should be able to convey his knowledge to the athletes and communicate with them enough to know what they expect from him (Sevim,

1998). A positive coach-athlete relationship, which is formed in an environment where positive communication processes are passed and positive relationships are established, not only increases athlete motivation and athlete satisfaction, but also provides a suitable environment for athletes to develop their skills (Altıntaş et al., 2012).



Exploring

In the first stage, technical directors are the practitioners of the training to organize continuous and collective activities aimed at revealing and developing the characteristics of the individual, strengthening his natural dynamism and showing a positive reaction to the external environment (Kolludar, 1988).

Development

In the second stage, the technical director is defined as a person who makes it easier for group members to jointly perform jobs and functions that they cannot find the opportunity to perform individually, and who has undertaken the responsibility of management (Kolludar, 1988).

Preparation

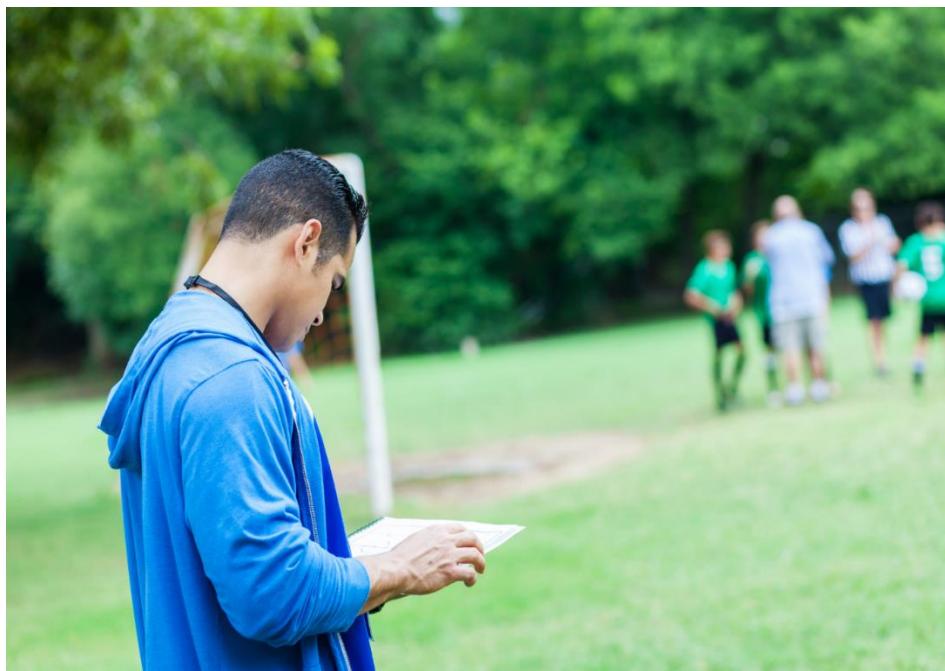
In the sense of modern sports, the coach is the person who carries the athletes to the peak of their performance, helps them realize their physical, social, emotional and mental capacities and prepares them for the matches (Erdem, 2005).



Managing

Management is the art of ensuring the realization of actions and actions that combine the efforts of individuals in order to reach the goals in the most accurate, most efficient and fastest way (Sunay, 2009). The basic principle of every institution and organization is to be well managed. The most basic principle of being a good team in sports with high combat power, such as football, passes through a correct management organization on and off the field. The person responsible for the management of the football team, the football players, the technical team and every issue related to the team is the coach. The coach can manage not only the technical and tactical matters, but also the economic and

administrative matters of the club. In some European leagues, coaches are also responsible for the club budget and transfer budget. For this reason, it would be best to look at technical directors as managers.



The Head Coach and his role in the employment contract

The head coach(manager) is the central figure of a professional football club. First, he necessarily communicates with the media before the match. Second, it selects the squad, determines the squad, and decides on the strategy. The manager is responsible for interventions such as substitutions during the match. The third is responsible for post-match communication with the media. However, the manager often leaves the training sessions to other staff members, such as the first-team coach.

In continental union football, all these duties fall within the domain of the head coach. Of course, the continental-style head coach actively oversees the training sessions. As such, he has a strong collaboration with his team, including an

assistant coach and also special coaches for goalkeepers and (recently) forwards. However, long-term policies are often the responsibility of the so-called sporting director. In turn, the UK style manager is also responsible for transfer market policies and exploration. Thus, the latter follows both the short-term and long-term policies of the club.

Experience Effect on Coach Stability

Experience potentially protects the Head Coach from dismissal even if performance is below expectations. But that's not what Van Ours and Van Tuijl (2016) found in their study. As time spent at the club as a coach or player shows, familiarity with the club should reduce the likelihood of dismissal, which can increase job productivity by providing employees with insight into the characteristics and functioning of the club (Becker 1962). Signs of success in a coach's previous jobs (such as winning trophies or titles or promoting clubs) will also delay the point where the employer dismisses a coach based on performance. On the other hand, prior experience in the club (as a coach or player) along with more experience at one's current employer may indicate a high-quality job match relative to outside options and may make the Head Coach less likely to accept it. external offers (Ste vens 2003). The threat of outside offers will likely trigger counteroffers from the current employer.

The dismissals and resignations of football managers are not only interesting because of these analogies with business life (Bridgewater (2010)). First, they shoot a lot of media nervously. Both sacked and resigning managers at the highest echelons of professional football regularly make 'headlines', not only in the local media but sometimes around the world. Second, the financial consequences for the club in the event of an expulsion can be enormous. To determine the impact of firing a coach on team performance for teams whose coach was fired, we need to make inferences about the hypothetical performance that would have been achieved had the coach not been fired. A possible separation sometimes damages

the reputation of both the club as a future employer and the manager as a future employee.

Possible reasons for firing a coach

Planned or unplanned, there can be many reasons for a coach change. Some of those;

- Point losses
- lag behind the competition
- Dispute with club management
- Inability to communicate properly with the player group
- Wrong transfer redirects
- Fan dissatisfaction
- Financial problems within the club

Possible reasons for coach resignation

A coach may submit his or her resignation to the management, either planned or unplanned. Possible reasons for this situation;

- Better offer from a different club
- Feeling of inadequacy
- failure
- need for rest
- Dispute with management
- Delays and problems in salary and payment point
- family problems

Important criteria in the change of coach

Clubs' decision to change coaches is assumed to be based on a club's actual in-season performance compared to its expected in-season performance. performance is good or bad;

- Expected number of points per game for each club
- Number of points in last matches
- Total points can be evaluated according to the surprise in a particular season

(Stadtman, 2006) or the sum of all points since the start of the season. Also, if

the cumulative surprise falls below a certain threshold, the continued cooperation between the club and the coach may become questionable.

Length of Service of the Manager

To get an impression of the potential determinants of a Coach's dismissal, the number of games up to and from his dismissal in a given season should be examined. During this period, it is expected that the gains for the club will be evaluated objectively, compared with the losses and put on the scales. The dismissal of a coach may be based on a team's performance throughout the season or during a particular part of the season. Therefore, when analyzing the determinants of coach dismissal rates, two time-varying variables representing team performance, cumulative surprise and cumulative points in the previous four games can be taken as a basis. Comparing the performance before the change of coach with the performance after the change of coach is also one of the situations that should be considered when evaluating this process.



CONCLUSION

To maintain the Stability of the Football Team manager;

Clubs have found that information provides accountability through objective observation, allowing staff and athletes to provide feedback individually, as units, or as a team to identify areas for improvement. Groom et al., (2011) in choosing the right coach and measuring the consistency of the coach;

- (i) Able to assist players in developing an effective style of play for the team,
- (ii) To be able to follow their professional development and coaching practices,
- (iii) An in-depth review of technical team and player performances is essential.

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Chapter 3

The Importance of Genetic Factors in Sports Injuries

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ABSTRACT

The association between injuries and genetics in athletes is a novel topic of study that is still in its infancy. This study investigates genetic markers linked to non-contact sports injuries and reviews current achievements in sports genomics research. Candidate genes and insights from genome-wide association studies (GWAS) and meta-analyses are among the new discoveries. It is suspected that eleven gene polymorphisms (*IL-6*, *CRP*, *TNFA*, *SOD2*, *eNOS*, *ACTN3*, *COL1A1*, *COL5A1*) are linked to damage. As one of the crucial elements that might impact injury risk in sports, genetic variations play a vital role. However, the findings imply that the relationship between genetic predisposition and injury risk should be studied alongside environmental and lifestyle factors.

Keywords: Injury Risk, Athlete, Sports Genetics

ÖZET

Sporcularda yaralanma ve genetik ilişkisi, henüz emekleme aşamasında olan yeni bir araştırma alanı olarak büyük ilgi çekmektedir. Bu çalışma, darbelere bağlı olmayan spor yaralanmaları ile ilişkili genetik belirteçlerin incelemekte ve spor genomik araştırmalardaki son gelişmeleri özetlemektedir. Bu gelişmeler arasında aday genler ve genom çapında ilişkilendirme (GWAS) çalışmalarından elde edilen buğular ve meta-analizler yer almaktadır. Yaklaşık olarak on gen polimorfizminin (*IL-6*, *CRP*, *TNFA*, *SOD2*, *eNOS*, *ACTN3*, *COL1A1*, *COL5A1*) yaralanma ile ilişkilendirildiği düşünülmektedir. Genetik varyantlar, sporcularda yaralanma riskini etkileyebilen kritik faktörlerden biri olarak önemli bir oynamaktadır. Ancak, elde edilen bilgiler, genetik yatkınlığın yaralanma riski ile ilişkisi çevresel ve yaşam tarzı değişkenleriyle birlikte değerlendirilmelidir.

Anahtar Kelimeler: Yaralanma Riski, Sporcu, Spor Genetiği

INTRODUCTION

As the number of people participating in sports as recreational, professional, and amateur activities increases, the significance of sports injuries and the factors associated with these injuries also grows. Sports injuries are undesirable situations that negatively associated the performance and skill levels of athletes (Bulgay et al., 2021). Those who play sports in any sport can be exposed to various injuries throughout their lives. When the studies comparing the analysis criteria of injuries in athletes and the risk factors associated these injuries were examined, it was reported that the etiology of injury was multifactorial (Ünver & Kocaman, 2023; Bulgay et al., 2020; Eroğlu & Zileli, 2015; Maffulli et al., 2013).

Numerous studies have indisputably shown that injuries may be attributable to a wide variety of circumstances. The etiology of sports injuries is often complicated, with several factors influencing the likelihood of injury incidence. In recent studies, there has been a strong emphasis on researching injuries to the soft tissues of the musculoskeletal system, such as tendons and ligaments. To understand the possibility of injury in athletes, it is critical to examine the impact of inherited predispositions to tissue damage (Bulgay et al., 2020; Yamin et al., 2008).

Athletes' genetic features, such as musculature, tendon flexibility, and connective tissue health, have been demonstrated to correlate with the chance of incurring injuries. Personalization of genetic variants may be defined by their unique traits and vulnerability to damage. Within this context, the investigation of the relationship between genetic factors and sports injuries has the potential to allow the development of innovative and improved approaches targeted at grasping and minimizing the risk of injury among athletes. The investigation of the influence of genetic variables on sports injuries has the potential for the advancement of tailored strategies in injury prevention and rehabilitation, hence fostering the long-term well-being and durability of athletes (Edouard et al., 2023; Moreno et al., 2020).

The present study investigates the influence of genetic variables on sports-related injuries and investigates the potential of personalized approaches in identifying and mitigating the risk of such injuries. Gaining insight into the correlation between genetic variations and sports-related injuries might be pivotal in facilitating players' engagement in sports activities with enhanced physical well-being, increased resilience, and improved performance. Within this particular context, the objective is to demonstrate the use of genetic information within the field of sports science, as well as to identify the specific areas of future study that should be advanced. Based on the aforementioned results, it can be posited that the acquired knowledge will serve as a valuable resource for sports scientists, trainers, and sports doctors in comprehending the enhanced athletic performance shown by players.

Innovations in sports injury risk comprehension and mitigation

Since the Human Genome Project (IGP) (1995–2003) was completed, genetic research has been undertaken during the last 20 years to shed light on key genetic factors that affect athletes' performance as well as particular factors linked to a higher risk of sports injuries. The results of this study demonstrate that polymorphisms connected to non-impact injuries may be found through genetic analysis, which can be a highly useful technique. Coaches, physical therapists, and athletes may utilize the information they've learned to tailor their training and/or avoid accidents (Bulgay et al., 2023; Yıldırım et al., 2023; Tarnowski et al., 2022; Kim et al., 2014).

The results of this research imply that athletes' musculoskeletal health, muscular performance, and connective tissue endurance are inherited. Genetic differences like polymorphisms may increase or decrease tendon and ligament damage. These findings will help develop new sports injury prevention and management methods. Genetic testing may also identify damage-prone persons. Risk factors particular to each person might guide training programs. This strategy improves athletes' performance and reduces injury risk. These

programs may be tailored to a person's genetics and risk tolerance. An individual's genetic profile may also be used to develop new training adaptation methods (Baumert et al., 2016; Saragiotto et al., 2014; Eynon et al., 2011).

The above study suggests a hereditary component to athletes' musculoskeletal health, muscular performance, and connective tissue endurance. Tendon and ligament injury may be affected by genetic variations. The above findings help build new sports injury prevention and treatment solutions. Genetic testing may also identify injury-prone individuals. Individual risk factors should be considered while creating workout regimens. This lets the athlete improve her performance without harm. These programs may be tailored to genetics and injury risk. Additionally, genetically based training approaches may be developed to assist adaptation (Murtagh et al., 2023; Varillas-Delgado et al., 2023).

Some researchers claim that using genetic variations to explain sports-related injuries has its limits. These researchers stress that sports-related injuries and athletic performance are of a limited character, notwithstanding the possibility that hereditary variables may affect injury risk and athlete ability. They emphasize that just one element of the damage is explained by hereditary variables in this situation. Athletes' risk of injury and performance may also be influenced by elements including epigenetics, training techniques, biomechanical aspects, dietary habits, sleep hygiene, and psychological and environmental circumstances. These influences must be thought of in addition to hereditary ones. Furthermore, if genetic testing is overemphasized in determining injury risk, athletes may develop a poor grasp of hereditary issues. People who think in this manner may refrain from participating in sports. Athletes' motivation and performance may suffer as a result of relying only on hereditary variables to determine their talents and aptitudes (Murtagh et al., 2023; Massidda et al., 2019; Saragiotto et al., 2014).

Inflammatory, Healing, and Injury Responses in Athletes

Different genetic variations may link athletes' inflammatory and healing responses. Individual variances in inflammatory processes and the speed of healing after injury may result from this interplay. Understanding the injury risk and recovery potential of athletes, in particular, the capacity of genetic variables to control inflammatory responses and impact post-injury healing processes, is an important topic of study (Jang et al., 2013; Collins & Posthumus, 2011; Posthumus et al., 2009; Khoschnau et al., 2008; Neubauer et al., 2008; Yamin et al., 2008; Bastaki et al., 2006; Mokone et al., 2006).

Genetic variants play an important role in determining non-impact injuries as well as athletic performance (Bayraktar et al., 2023; Demirci et al., 2023; Cerit et al., 2020). Knowing the individual genetic analysis of non-impact injuries will help determine the advantages of the athlete and identify the disadvantages that need to be overcome (Eken et al., 2018). The increased risk of sports-related injuries or characteristics that make athletes more prone to injury have recently been linked to a variety of genetic variants (Maestro et al., 2022). Examples of molecules linked to inflammatory and healing responses include Interleukin-6 (*IL-6*), C-reactive protein (*CRP*), Tumor necrosis factor (*TNFA*), Superoxide dismutase 2 (*SOD2*), and endothelial nitric oxide synthase (*eNOS*). Gene variations for Alpha actinin-3 (*ACTN3*), Collagen 1 alpha 1 (*COL1A1*), and Collagen 5 alpha 1 (*COL5A1*) have been linked to damage. These genetic variations may influence how an athlete's body responds to injury. Inflammation plays a significant part in the recovery after damage and may result in pain, swelling, and edema. Athletes' varying genetic make-up may also affect how quickly they heal from injuries. An athlete's recovery period after an injury might fluctuate significantly depending on whether or not a genetic variation is present. As a result, when an athlete sustains an injury, variations in their genetic make-up might affect how quickly and effectively they heal (Heffernan et al., 2017; Jang et al., 2013; Collins & Posthumus, 2011; Posthumus et al.,

2009; Khoschnau et al., 2008; Neubauer et al., 2008; Yamin et al., 2008; Bastaki et al., 2006; Mokone et al., 2006).

Understanding how genetic variables affect inflammatory and healing responses in this situation is crucial for athletes and coaches. This knowledge may be used to develop rehabilitation programs and more efficient procedures. Optimizing post-injury recovery may require the development of tailored rehabilitation strategies based on athletes' genetic profiles. Athletes may be helped in this manner to recover more quickly, live healthier lives, and keep up their performance.

Athlete Injury Risk: A Multi-Factor Approach

Other variables seem to be significant in predicting the risk of injury in athletes in addition to hereditary considerations. Athletes and coaches may make training and competition environments safer and healthier when they are aware of how each of these elements, alone or in combination, might raise the risk of injury. By resulting in muscular exhaustion, damaged joints, and weak ligaments, overtraining may raise the chance of injury. By causing muscular imbalances and poor stability, bad training techniques might raise the chance of injury. The body may be unable to get the nutrients required for repairing muscles and tissues due to malnutrition. Dehydration may impair muscle function and raise the possibility of injury. Injury risk may be increased by having weaker muscles, less flexibility, and lower fitness levels (Maestro et al., 2022; Ahmetov et al., 2022; Dinç & Gökmen, 2019; Ahmetov & Fedotovskaya, 2015).

Injury may be caused by improper or unsuitable equipment usage, poor ground conditions, or a lack of safety. Without the right technique, excessive pressure may be applied, endangering the health of the muscles and joints. Previous injuries or pain may make people more prone to damage owing to weaker muscles or restricted range of motion. Stress and mental health issues may raise the risk of injury by distracting people and affecting their ability to

coordinate their muscles. As a result of the relationship between muscle and bone structures, the risk of injury might vary with age groups, body types, and gender. Overuse injuries may occur if you exercise often without getting enough rest or recovery time (Semenova et al., 2023; September et al., 2009; Mokone et al., 2006).

Athletes may keep their physical health and performance at their highest levels by combining these aspects. In order to reduce the risk of injury, it is important to develop customized training plans and injury prevention tactics that take into consideration the unique qualities and training requirements of the athletes.

Obstacles to Genetic Variant Injury Risk

Numerous difficulties and complications are present in the study of how hereditary variables affect an athlete's risk of injury. Understanding the interplay between genes and the environment as well as precisely estimating damage risk may be hampered by these variables. The risk of damage may be influenced by a wide range of variables, some of which may even interact with one another complexly. Numerous elements, such as epigenetics, training routines, sports experience, diet, gear, and psychological state, are among these variables. These elements may make it more challenging for genetic variables to predict injury risk. Genetic contribution is a complicated process that often involves the interaction of many genes or multigenes. Consequently, there are instances when a single gene is inadequate to predict the likelihood of harm (Bulgay et al., 2023; Varillas-Delgado et al., 2022; Massidda et al., 2019; Posthumus et al., 2009; Saragiotto et al., 2014; Collins & Posthumus, 2011; September et al., 2009).

In general, studies addressing the link between genetics and injuries may be carried out with small sample numbers. The generalizability and statistical validity of the acquired findings may be constrained as a consequence. Genetic testing is recognized to raise ethical issues including privacy, discrimination,

and informed consent. These issues could be connected to research involvement. distinct populations may have distinct genetic variations. As a result, genetic connections discovered in one group could not hold true in another. Over time, genetic influences might have different effects. Epigenetic impacts (genetic influences caused by environmental variables and lifestyle changes) may be altered with age, and this can lead to changes in study findings over time (Varillas-Delgado et al., 2022; Zouhal et al., 2021; Bulgay et al., 2020; Moreno et al., 2020; Collins & Posthumus 2011).

Notwithstanding the many challenges, there has been significant advancement in the field of study pertaining to the correlation between genetics and harm. The advent of new technology and analytical approaches has prospects for enhancing our comprehension of this particular field. Enhancing our comprehension of the influence of genetic variables on injury susceptibility among athletes will facilitate the formulation of more efficacious approaches aimed at safeguarding their well-being and optimizing their performance.

Athletes may benefit from genetic testing to avoid injuries.

These ideas about the impact of genetic predisposition on injury risk and preventative techniques in athletes are critical. Athletes may exercise more safely and successfully if they have personalized preventative programs and make educated decisions. Understanding genetic predisposition may assist athletes in becoming more aware of potential injury concerns. Athletes may use this information to design training regimens that target their weak points and include unique workouts and stretches. Furthermore, understanding genetic inclination might assist athletes in determining which activities they should prioritize (Bulgay & Ergun, 2022; Bulgay et al., 2019; Posthumus et al., 2009; Khoschnau et al., 2008; Neubauer et al., 2008; Yamin et al., 2008; Bastaki et al., 2006; Mokone et al., 2006).

The findings of genetic profiling might assist sportsmen better control their training load and avoid harmful playing positions. Using the data gathered,

coaches and sports doctors may make more educated judgments and provide greater assistance to players. Athletes may benefit from genetic testing to better understand their metabolism, nutrition intake, and muscle fiber composition. This information may help athletes build tailored diet and training plans to lessen the chance of injury. The findings of genetic testing enable athletes to begin preventative measures against specific injuries for which they are at a greater risk sooner. This may help minimize injury risk and increase performance. Athletes may use genetic predisposition information to tailor post-injury rehabilitation regimens. These results may aid in speedier healing and lessen the danger of repeated damage (Varillas-Delgado et al., 2023; Varillas-Delgado et al., 2022; Maestro et al., 2022; Jang et al., 2013; Collins & Posthumus, 2011; Posthumus et al., 2009; Khoschnau et al., 2008; Neubauer et al., 2008; Yamin et al., 2008; Bastaki et al., 2006; Mokone et al., 2006).

CONCLUSION

Individuals may have different effects from genetic polymorphisms on injury risk. While a genetic mutation may raise one athlete's risk of injury, it may not have the same impact on another. At this time, genetic predisposition accounts for just a portion of damage risk. Training techniques, training arrangements, proper equipment usage, dietary habits, and sleep patterns are all connected with the risk of injury in athletes. Innovative techniques to understanding and managing the risk of injury in athletes, such as customized medicine and genetic testing, are constantly being developed. By taking the athletes' genetic predispositions into account, it may be feasible to develop more appropriate training regimens and preventative measures. However, since the field is still in its infancy, the complete influence of genetic variables on sports injuries is unknown, and this is an area of ongoing study.

Understanding an athlete's genetic vulnerability to injury may lead to the adoption of specialized injury prevention techniques that reduce injury risk while maximizing capability on the field. It is crucial to note, however, that

Innovative Research in Sport Sciences

hereditary variables are not the sole determinants of damage sensitivity. Training methods, tactics, and environmental conditions all have a role in an athlete's risk of injury. To summarize, using genetic variables simply as a viewpoint for understanding and treating injury risk in athletes may be inadequate. Injury development is a very complicated process that includes a complex interaction of genetic variables, environmental effects, and athlete behavior. New genomics technology is assisting us in better understanding the link between the specifics of gene variations associated to non-contact sports injuries.

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