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Review

Economic Reflections of the Injury Prevention and Rehabilitation Processes of Athletes Affiliate to Sports Clubs: An Interdisciplinary Review

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Abstract

This literature review aims to examine the results of scientific studies conducted to date under the title of sports injuries, both their effects on the athletic performance of athletes and their changes on the financial stability of sports clubs from an interdisciplinary perspective. The study is founded upon a thorough review of extant literature. In the course of preparing the review, a number of databases were searched, including Google Scholar, PubMed, and ResearchGate. The following Turkish keywords were used: sports economics, rehabilitation, injury prevention and sports clubs. The same keywords were also searched for in their English equivalents. The following subjects will be covered: sports economics, rehabilitation, injury prevention, and sports clubs. The present study exclusively encompasses publications in Turkish and English. The findings emphasise the pivotal role of strategic approaches to load management and injury prevention, not only in optimising athlete performance but also in their substantial ramifications for the economic landscape of sport. In this context, the study emphasises that the prevention of sports injuries should not be regarded solely as a health issue, but also as a fundamental component of sports economics.

Keywords

Injury prevention, rehabilitation, sports clubs, sports economics

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Introduction

The concept of sport is not confined exclusively to physical performance and related indicators; rather, it represents an industrial phenomenon encompassing economic, cultural, and various social dimensions (Smith and Stewart, 2015). In the contemporary sporting landscape, professional sports clubs, which are evaluated within a professional framework, have shifted their focus beyond the pursuit of talented athletes to achieve high-level success. Instead, there is a tendency to adopt scientific approaches in training methodologies, to make strategic plans regarding health management, and to implement economically sound decisions to support long-term investments (Taylor et al., 2022). Consequently, injuries sustained by athletes, in addition to the subsequent processes of returning to the field and undergoing rehabilitation, have the potential to engender various disruptions in the planning strategies of clubs and in the career development trajectories of the athletes themselves. In addition to being significant health-related challenges, these issues are also regarded as threats to the financial sustainability of sports clubs (Drawer and Fuller, 2002).

Athletic injuries constitute a substantial problem for the sports industry, given the associated direct and indirect costs. The treatment required during the recovery period, as well as the rehabilitation process necessary for an athlete's return to the field, not only result in athletes being absent from competition for extended periods but also impose financial burdens on sports clubs. These include ongoing salary expenses, loss of performance, medical treatment costs, and potential cancellations of sponsorship agreements. When considered specifically in the context of professional sports clubs, it becomes evident that such injuries can be a critical factor influencing seasonal success (Hägglund et al., 2013).

Rehabilitative practices and injury prevention efforts, which fall within the scope of sports sciences, should not be evaluated solely from the perspective of health sciences. From a sports economics perspective, these practices should also be regarded as strategically important elements. The economic dimension of sport necessitates an interdisciplinary approach, encompassing physiotherapy methods, training sciences, athlete monitoring techniques, and data-driven load management (Jones et al., 2019). These contemporary

practices serve as the scientific foundation of the process, fostering collaboration across various disciplines. Such multidisciplinary approaches have been shown to be effective in maintaining athlete health and performance and they also play a significant role in reducing the financial burdens and potential losses faced by sports clubs (Bahr and Krosshaug, 2005).

The aim of the conducted study is to evaluate the applicability of both preventive and rehabilitative practices developed to protect athletes from injuries and harm in sports clubs, as well as to assess their economic impacts on sports clubs from an interdisciplinary perspective.

Method

The present study constitutes a literature review. During the preparation of the study, the keywords sports economics, rehabilitation, injury prevention and sports clubs were searched in Turkish, and sports economics, rehabilitation, injury prevention, and sports clubs were searched in English using the databases Google Scholar, PubMed, and ResearchGate. The review exclusively encompassed publications in Turkish and English. The literature search in the databases started on February 3, 2025 and ended on May 4, 2025. A total of 49 studies were included in the study, those that were compatible with the title methodology of the study.

Discussion

The Economic Evaluation of Sports Injuries

In the field of professional sports, injuries sustained by athletes are not merely viewed as a loss in performance; they are a matter of significant concern. This issue is regarded as a critical problem with serious economic consequences. This economic process has been analysed by sports economists and can be examined under two main categories: direct costs and indirect costs (Drawer & Fuller, 2002).

Direct Costs

The topic of direct costs includes the medical treatment methods athletes are subjected to, their rehabilitation processes, and the compensation items that need to be paid to the athlete during this period. Especially in professional sports clubs, it is known that the individualized and comprehensive healthcare services required during the rehabilitation of an injured athlete constitute a significant portion of club budgets.

Moreover, even if a professional club athlete does not receive a match-based payment, their seasonal salary continues to be paid, making it a non-productive expense for the club, as it provides no return (Ekstrand et al., 2011). In a comprehensive study conducted by Ekstrand and colleagues, UEFA reported that professional football clubs in Europe spend, on average, around 20 million euros annually due to injuries. However, they emphasized that this cost was not simply due to the player's absence from the match, but rather because the injured player's absence negatively affects team performance, which in turn impacts revenue generation (Ekstrand et al., 2011).

Indirect costs

The topic of indirect costs encompasses broader economic processes. These include reductions in sponsorship revenues and merchandise and ticket sales, as well as negative impacts on brand value due to declining team performance and reductions in broadcasting revenues (Gabbett, 2016). Long-term injuries to a team's highest-scoring players, in particular, can significantly weaken the team's competitive presence on the field, lead to reduced fan engagement and result in decreased media visibility.

In addition, the need for rapid and unexpected transfers due to injuries, the impact of substitute players on performance and deficiencies in on-field strategic planning are also examples of indirect costs (Schwellnus et al., 2016). These situations suggest that evaluating professional sports clubs solely in terms of athlete health may not be the most appropriate approach. It is therefore essential to consider the club's risk factors from multiple perspectives. To ensure the organisation's sustainability, a holistic approach to risk management is more appropriate.

Strategic Approaches and Areas of Implementation for the Prevention of Sports Injuries

In professional sports clubs and environments where athletes train and compete, the importance of treating and preventing sports injuries is significant in terms of both economics and athletic performance. Modern sports clubs take professional precautions against potential injuries by integrating science-based, multidimensional approaches into their training systems with the aim of minimising injuries (Gabbett, 2016).

Proper planning of training load

One of the greatest risk factors for athlete injury is the training load applied. Designing training sessions that are appropriately and methodologically sound is one of the most important strategies for preventing injury. Sudden increases in training intensity over a short period of time and failing to assess the athlete's previous training session (e.g. recovery time) can lead to the athlete exceeding their physiological tolerance and increase the risk of injury (Chan et al., 2024). The science-based explanation for this situation is the "Training-Injury Prevention Paradox" model, which suggests that injuries can occur at both low and high training volumes. According to the model, the most important strategic approach to preventing this is proportional and progressive loading (Gabbett, 2016). In addition, to properly manage training load, it is considered more accurate to base injury risk modelling associated with sudden increases in load on scientific principles, using assessment criteria such as the Acute:Chronic Workload Ratio (ACWR) and similar metrics (Blanch & Gabbett, 2016).

Balance training and functional strength

Studies have shown that training programmes targeting specific muscle groups, especially neuromuscular training plans that support balance development, significantly reduce the incidence of sports injuries. The "FIFA 11+" programme, developed by FIFA, has been found to result in a reduction of approximately 30% in injuries to athletes in both amateur and professional groups (Soligard et al., 2008).

Injury prevention approaches focus not only on increasing physical strength, but also on enhancing defensive mechanisms such as movement control, flexibility, proprioception and balance.

Data-Based monitoring systems in preventive ınterventions

The importance of technology-supported, data-based practices aimed at protecting athlete health is increasingly recognised today (Bartels et al., 2024). Modern tools such as GPS-based load monitoring systems, heart rate monitoring devices, thermal imaging technologies and force assessment platforms now make it possible to scientifically define and track processes such as creating personalised athlete load profiles, measuring fatigue levels and monitoring potential injury risks (Schwellnus et al., 2016).

Evaluating the Economic Impact of Sports Clubs' Prevention and Rehabilitation Processes for Sports Injuries

Preventing athlete injuries and developing related strategies are important not only for athlete health, but also for the sustainability of economic policies in sports clubs. The positive outcomes of these programmes can be analysed in terms of short-term cost savings and their potential long-term benefits for organisational planning (Finch, 2006).

Reducing Healthcare Costs for Sports Clubs

By reducing the severity and frequency of athlete injuries, club expenditures related to medication, physiotherapy and treatment costs decrease directly (Turnbull et al., 2024). A study conducted with the Norwegian Football Federation found that football teams that regularly implemented the FIFA 11+ protocol experienced a 37% improvement in their club budgets (Soligard et al., 2010). This can give amateur or semi-professional sports clubs with limited financial resources a significant advantage.

The Impact of Performance Continuity on Revenue Growth in Sports Clubs

By preventing athlete injuries, club teams can increase their chances of achieving sporting success throughout the season by keeping their best players on the field. This definition of success also encompasses areas such as sponsorships, ticket sales and broadcasting revenues. Conversely, long-term injuries to key players can lead to a decline in media interest, resulting in a significant loss of visibility for the club's brand (Ekstrand et al., 2013). For these and similar reasons, integrating injury prevention programmes into training methods helps sports clubs reduce expenditure and supports consistent and sustained athletic performance. This, in turn, can form the basis of a strategic plan to increase revenues.

Long-Term Planning and Return on Investment

The economic analysis process and evaluations of the return on investment for expenditure on athlete injury prevention programmes have yielded highly positive results. In a 2006 study by Finch, it was calculated that for every dollar

invested in injury prevention interventions, approximately three dollars were saved. This return was found to be even more striking in sports clubs working with young athletes (Finch, 2006). Reducing athlete injuries can help to extend athletes' careers, enabling clubs to benefit from their investments for longer (Schwellnus et al., 2016).

Following the Covid-19 pandemic, the visible emergence of economic fragility in the sports sector has forced a reckoning with the fact that the financial structures of sports clubs depend largely on athletic success and the current health status of athletes. This makes the evaluation of injury prevention processes even more critical. A 2021 study stated that the pandemic created a devastating economic burden, particularly for small and medium-sized sports clubs, and that the suspension of sporting activities made managing athletes' healthcare expenses nearly impossible (Skinner & Smith, 2021).

Result

The injury process experienced by athletes is not just a physical obstacle, particularly within professional sports organisations. It also constitutes a significant economic risk factor for sports clubs. The costs arising from injuries result in performance and time losses for athletes, creating a financial imbalance that negatively impacts the economic stability of sports clubs. Therefore, it is important to recognise that training programmes that integrate sports technology and strategic plans designed to minimise injury risk are crucial not only for maintaining athlete performance, but also for supporting the economic sustainability of sports clubs.

A scientific review has clearly demonstrated that managing training load, implementing data-driven monitoring systems and applying neuromuscular-based exercise programmes can significantly reduce the risk of sports injuries and lower sports clubs' expenditure. Programmes such as FIFA 11+ have been found to prevent a substantial number of injuries at relatively low cost. Furthermore, a well-planned training load management strategy combined with personalised, up-to-date monitoring systems for athletes supports both athlete health and the economic sustainability of sports clubs by taking a more holistic approach. Based on the information obtained from the review, the following recommendations can be made to readers:

- Both amateur and semi-professional sports clubs with limited budgets, as well as professional sports clubs, can implement long-term injury prevention programmes for athletes that go beyond short-term treatment approaches.
- Sports clubs can conduct cost and outcome analyses of injury prevention programmes for athletes and use the results of these analyses to inform investment decisions.
- Pre-season training plans can take the balance of acute and chronic loads into account, and regular data sharing between coaches and healthcare teams can be implemented to systematically monitor athlete health.
- In amateur sports clubs, injury prevention programmes can be standardised to support athletes in leading healthier lives during and after their sporting careers.

The integration of new, up-to-date strategies into the training process has made approaches to athlete health more proactive. Recent studies show that injury prevention programmes are not only related to athlete health, but also closely tied to the economic stability of sports clubs (Turnbull et al., 2024).

For this reason, sports clubs are now analysing individualised load tracking supported by artificial intelligence, which has allowed even standard warm-up protocols to change (Bartels et al., 2024; Chan et al., 2024). Finally, it is important to understand that sports science and sports economics are interrelated areas that occupy a cross-disciplinary intersection, rather than separate fields. These fields are crucial for both club performance and financial planning. Thanks to technological advances in scientific evaluation, athlete health can be assessed with greater accuracy, while financial losses can also be minimised.

Author contributions

The author contributed to the manuscript's conceptualization, analyzed, editing, and finalization.

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