Chapter 13
AI Applications in Sports Medicine:
Unraveling the Influence of Physical Education on Sports Injury Outcomes

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ABSTRACT

In the contemporary sports landscape, the integration of artificial intelligence (AI) has become pivotal in comprehending and optimizing athletes' performance and well-being. This study focuses on unraveling the intricate dynamics between physical education training, treatment protocols, and the occurrence of sports injuries

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through an AI-driven analytical framework. The study not only aims to quantify the impact of physical education on injury prevention but also seeks to provide actionable insights for coaches, medical professionals, and athletes themselves. By harnessing the power of AI, this research aspires to contribute to a more informed and proactive approach to sports management, promoting the longevity of athletes' careers and safeguarding their overall well-being. Therefore, it is essential to analyze the sportsperson's track data to keep an eye on his health. As AI continues to reshape the sporting landscape, this investigation stands at the intersection of technology and athletics,

INTRODUCTION

The world of sports is increasingly turning to data and technology to enhance performance and safeguard athletes' well-being (Barua, 2024; Gomez et al., 2024; Lobo et al., 2024; Morris et al., 2024). Artificial intelligence (AI), in particular, is being utilized to optimize training, improve performance, and even predict outcomes (Mishra et al., 2024). Among these advancements, AI-driven deep analytics is emerging as a transformative tool, offering unprecedented insights into the complex relationship between physical education (PE), training regimens, treatment protocols, and sports injuries. This research will explore the potential of AI to revolutionize how we understand, predict, and mitigate sports injuries (Dhanke et al., 2022). Sports, particularly high-impact disciplines such as athletics and football, often witness frequent injuries due to the physical demands of intensive training and rapid, dynamic actions. With the rise of AI, there is a growing need to examine how PE and training impact athletes' health and performance. This study leverages a recurrent neural model to assess the correlation between physical training, treatment protocols, and sports injuries, using AI to analyze athletes' daily training regimens and predict injury risks (Meng & Qiao, 2023).

Artificial Neural Networks (ANN) serve as the foundation of this investigation. These networks consist of interconnected nodes that process data in a temporal sequence, allowing the model to track the chronological flow of events. The recurrent neural model mimics human cognitive processes, analyzing patterns from past injuries to provide a comprehensive understanding of the relationship between training, treatment, and injury occurrence (Chantamit-o-pas & Goyal, 2018). Injuries in sports not only jeopardize athletes' careers but also result in substantial financial losses for teams and organizations. The developed AI model offers a proactive strategy by predicting injury risks and recommending rest periods during recovery. By analyzing athletes' performance data, the model ensures vigilant health monitoring and facilitates timely interventions, promoting a safer and more informed approach