Original Article

Enhanced the anxiety monitoring system among athletes with IoT for sports performance: a review

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Abstract:
Modern sports have made considerable utilization of advancements in robust modern technology for anxiety monitoring systems (AMSs). This study introduces the AMS for sports athletes based on the Internet of Things (IoT) which accurately identifies athlete performance. In sports applications, the technological devices integrated with IoT systems have been extensively used for the real-time utilization of the athlete's health conditions for anxiety factors, instead of tracking real-time location between the athlete and the coach. Several anxiety parameters were discussed in this study, due to athletes' inconsistency in performance issues. This review model incorporates athlete psychological and physiological anxiety parameters and multiple sensors of an AMS-IoT to enhance overall sports performance. An IoT health monitoring system was explicitly designed based on a sports application, and encompasses four primary aspects: sensing, networking, data processing and an application layer. The IoT technology can connect functions between sensors, microcontrollers, cloud systems, technological devices, and digital equipment for the targeted users. The communication between IoT devices mainly involves wireless communication, and accessibility is open with any Internet-enabled device. Based on the review, using an AMS during games results in improved readiness for athletes during the actual competitions. The coaches can provide appropriate training to the athletes according to their current health conditions. Therefore, the can AMS greatly assists the coaches in designing training activities for their athletes. It is highlighted that an efficient monitoring system can produce consistent and excellent sports performance according to the athlete's individual fitness level. The further study emphasizes that AMS powered by IoT technology merits further investigation based on athletes and their sport's needs.
Key Words: -Athlete performance, internet of things, anxiety monitoring system, and sport application

Introduction

The intelligence of anxiety monitoring systems (AMSs) to communicate autonomously between persons, devices, and sensors in real-time is called the Internet of Things (IoT). The involvement of IoT technology in sport applications improves athlete performance under various circumstances, whether during training, or in actual competitions. A significant problem in the current sports world these days is the rising number of players who exhibit inconsistent performance between their training sessions and actual competitions (Karahan, 2020). The focus on physical training and game strategy cannot encourage athletes to perform optimistically. Inconsistent performance among athletes requires the coaches to be ready with appropriate multiple training sessions. Coaches must be aware that the elements of psychology and physiology are vital in enhancing an athlete's overall performance. When the athletes face high pressure during games, sudden changes in their psychological and physiological conditions are referred to as competitive anxiety.

Competitive anxiety comprises four general elements: cognitive, somatic, affective and motoric components (Hasanah & Refanthira, 2020). However, in this review, the researcher will limited the study to cognitive and somatic components, since they contribute most to competitive anxiety in sports (Wan Ahmad et al., 2022). Cognitive anxiety arises due to psychological changes as anxiety arises due to fear of surroundings, failure, and lack of confidence. In contrast, somatic anxiety is a physiological response that includes changes in heart rate level, difficulty in breathing, and changes in muscle tension. However, the physical symptoms occur due to psychological influence criteria. Notably, the level of competitive anxiety significantly differs between individual sports and team sports. Individual sports such as archery, darts, rifle shooting, running, gymnastics, judo and golf require high individual skills in self-concentration and confidence level, and strong skills in the kind of sport itself (Loh & Chong, 2018). Individual athletes tend to exhibit more serious psychological

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