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RETHINKING EXTRA-TIME IN MAJOR NATIONAL FOOTBALL TOURNAMENTS

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ABSTRACT

Extra-time (ET) of 30 minutes is played if football match scores are level after 90 minutes in tournament knockout play. The demanding schedule of these tournaments along with possible ET matches in the knockout stages significantly increase players' overload and injury risk. Present study aimed to determine whether ET during major football national team tournaments contributes to the game outcome. Data on the percentage of elimination matches that needed ET, and the percentage of ET matches that eventually required shootouts were retrieved. Over the years, increased number of participating teams lead to increased number of knockout games, and more knockout games needed ET (13% until 1978, 33% from 1982, in FIFA World Cup). In a significant percentage of matches, the ET itself did not determine the winning team, and the majority of ET matches winners were determined by shootouts (FIFA World Cup since 1982: 60.8%; UEFA European championship: 61.3%; Copa America: 92%). The purpose of playing ET is to make a fair game outcome, and not leave the winning decision for shootouts. However, since in most matches ET does not determine the winner, while significantly increasing the player's overload and injury susceptibility, the need for ET mandates rethinking.

Keywords: *football, extra-time, injury*

INTRODUCTION

Football is an intermittent team sport, requiring both aerobic and anaerobic abilities along with technical and tactical skills [10]. During the regular local leagues, football season matches are typically played as two 45 min halves. However, in single-elimination tournaments where only one team can advance to the next round or win the tournament, if scores are level after 90 min, an additional 30 minutes (termed extra-time – ET) is the current standard procedure performed to bring a game to a decision. If the score remains tied after the 30-min extra-time, the winner is decided by shootouts. Major national team football tournaments like the FIFA World Cup, UEFA European championship, Copa America and Asian Football Confederation Asian Cup are played on top of the busy regular season schedule, and some are conducted at the end of the regular football season when players are both physically and mentally exhausted. Moreover, the match schedule in these tournaments is usually intense (e.g. match every 3–4 days). Therefore, teams may be required to play in one or several 120 minutes matches. This may result in accumulated fatigue, player's exhaustion, greater risk for injuries and reduced team performance.

Recent studies indicate that ET negatively impacts both physical [9], mechanical [4] and technical [7] performances. Russell et al. [9] demonstrated using GPS data reduced total distance and high intensity distance covered, total number of sprints, accelerations and decelerations during ET. Field and colleagues [4] reported reduced mechanical efficiency with game duration and in particularly during ET. In addition, Harper et al. [7] demonstrated a decrease of the total number and successful passes and dribbles during ET compared to the regular 90 minutes match. Moreover, Kubayi and Toriola [8] showed that the number of goals scored in ET during matches in the FIFA world cup tournaments 1998–2014 was relatively lower compared to the first 90 minutes. Some of these measures (dribbling precision) but not others (15 and 30m sprint velocity, 30m sprint maintenance and dribbling speed) were improved following carbohydrate-electrolyte gel supplementation prior to the ET [5].

While practitioners agree that ET is important in knock-out football matches [6], it is unclear whether ET truly determines the match winner in most cases, or just bridges between the 90 minutes' match and shootouts. The aims of the present study were: 1. to find out the percentage of matches that needed ET to determine the winning team in major football tournaments and 2. to find out what percentage of these knock-out matches ET was truly decisive.

MATERIALS AND METHODS

Following institutional review board approval, data of all elimination matches from four major national team football tournaments, including the FIFA World Cup, the UEFA European championship, the Copa America and the Asian Football Confederation – AFC Asian Cup, were retrieved from the corresponding official websites of each tournament. The variables collected were the number and percentage of elimination matches that needed ET, and the number and percentage of ET matches that eventually required shootouts to determine the winning team.

RESULTS

The percentage of ET matches, and percent of ET matches that were eventually determined by shootouts during knockout stages in the four major tournaments are shown in Figure 1. Overall, in parallel to the increase in participating teams over the years, the number of elimination matches increased as well.

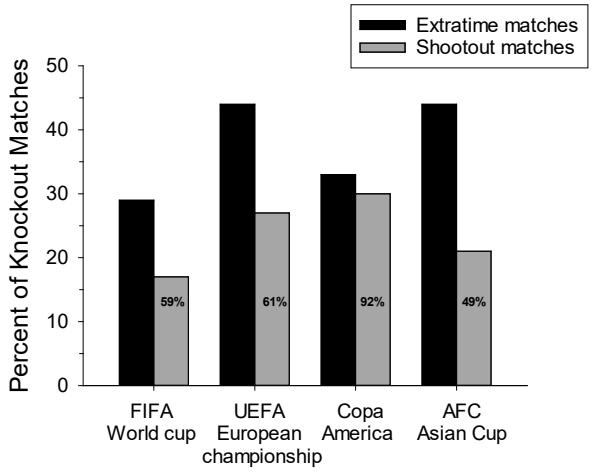

Figure 1. Percent of knockout matches requiring extra time during the four major tournaments and relative number of ET matches that were decided by shootouts.

In the FIFA world cup tournament, until 1978, there were very few ET matches (13.5%), and none was decided by shootouts. Since 1982, 33.3% of the knockout matches needed ET, and 60.8% of them were eventually determined by shootouts. Five tournament's final matches needed ET, (one was determined by shootouts).

In the UEFA European championship tournament, the number of elimination matches increased as well. 41% of the knockout matches needed ET, and 61.3% of them were eventually determined by shootouts. Six of 15 tournament's final matches needed ET (two were determined by shootouts).

In the AFC Asian Cup tournament, 44% of the knockout matches needed ET, and 48.5% of ET matches were eventually determined by shootouts. Five of 13 tournament's final matches needed ET (two were determined by shootouts).

In the Copa America 33% percent of the knockout matches needed ET, and 91.6% of them were eventually determined by shootouts. Four of the 12 tournament's final matches needed ET (all were determined by shootouts).

DISCUSSION

The purpose of the present study was to determine whether ET during major football national team tournaments actually contributes to the game winning decision. Several patterns are very clear from the results. First, along with the increase in the number of participating teams, the number of knockout games also increases. Second, over the years more knockout games are not decided in the regular 90 minutes match and go to ET. Third and most important, in a very significant percentage of the ET matches, the extension itself does not contribute to the match outcome. Except for the AFC Asian cup ("only" 48.5%), in all other tournaments studied, more than half of the ET matches were finally determined by shootouts. The most striking data comes from the Copa America tournament. Thirty-three percent of knockout stage matches of this tournament needed ET, and in 92%! of these games the winning team was finally decided by shootouts, emphasizing the negligible contribution of ET itself to determining the winning team. This was possibly the rationale for the exceptional decision in the last 2019 Brazil Copa America to skip ET and go directly to shootouts if the match was tied after 90 minutes in the tournament's knockout stages.

Although ET is a standard procedure in other sports as well when winning team is not determined at the regular game time, it is important to note that ET length in football is significantly longer than other sports, in both absolute and relative terms. In football, the ET length is 30 minutes, accounting for 33% of regular match time. In basketball, the additional time in is 5 minutes, accounting for 12.5% of regular match time (40 minutes). In Handball, the additional time in case of a draw is 10 minutes, which is 16.6% of the regular match time (60 minutes). In volleyball if a game reaches a fifth set (20% of the total match), the final set is shortened to be played

up to 15 instead of 25 points. Therefore, one may claim that in football, ET performance reflects mainly the players' physical condition and not football skills per se, whereas in other team sports the players' specific skills will be the decisive outcome factor. The notion of short ET exists also in individual sports. For example, in tennis, in case of a set draw, the extension would be played as "tie breaker" which is equivalent to about 2 games that accounts to about 2.5% of the set time. In Grand Slam tournaments, where matches are played to the best of five sets, it is not customary to play tie breaker in the fifth set. However, acknowledging the heavy load of such tournament and in order to protect the players, it was decided at this year's Wimbledon tournament that if a fifth set is tied at 12 games, the set winner will be decided by a tie breaker.

The reason for the longer ET in football is the fact that the number of goals scored in a game is low, and a shorter extension will probably not help to determine winning. Attempts have been made in the past to shorten ET by introducing the "Golden Goal" law, that is, once a team scores a goal in ET, the game ends. However, this led to greater careful team tactics during the ET and did not influence significantly match outcome and therefore this law was canceled.

However, it is impossible to ignore the fact that the tournaments surveyed in this work are played on top of or following a very demanding long football season. Football is becoming more tactical, and the gaps between teams' narrows. In addition, in recent years football has become more intense and physical [2] and therefore match extensions in such tournaments can lead to overload, reduced between games recovery ability and increased injury susceptibility [1, 3]. The two teams that make it to the championship's final are usually exhausted and injured and the team that needed more ET matches during the knockout stages will probably face the opponent from inferior starting point conditions. For example, in the 2018 FIFA world-cup final, Croatia (3 ET matches) lost to France (no ET games), and in the 2014 FIFA world-cup final, Argentina (3 ET matches) lost to Germany (playing only 2). This, along with the fact that most ET matches do not fulfil their initial goal to determine the match winner, requires rethinking regarding its necessity. Adopting the last Copa America decision to skip ET and go straight to deciding shootouts or other changes such as shortening ET length to 2×10 minute halves, reducing the number of elimination stages, increasing the number of possible player's substitutions or extending the overall tournament length are possible alternatives.

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