Analysis of shots performed during water polo matches at the 2016 Olympic Games

Menescardi, Cristina[1]; Estevan, Isaac[2].

[1] *Universidad Católica de Valencia "San Vicente Mártir", Faculty of Physical Activity and Sport Sciences, Valencia, Spain.*
[2]*University of Valencia, Faculty of Teaching, Valencia, Spain.*

Introduction
In Water polo, a key factor to score and success is shooting. Studies that analyzed variables related to shots and goals (e.g., Argudo, Ruiz, & Alonso, 2009) used efficacy coefficients that aimed to explain the relationship between tactics, as well as the quantity of goal attempts and their effectiveness. Efficacy coefficients add information about shot variables and allow coaches to modify tactical planning for future competitions if necessary. The aim of this study was to analyze shot and goals (in even, power play, and penalty micro situations) and the relationship between efficacy coefficient values according to the success (i.e., winner or loser) in Olympic matches.

Methods
Sixty-one Olympic matches were analyzed (Rio de Janeiro, 2016). Data were obtained from the following public domain: http://www.rtve.es/rio2016. Nine variables were analyzed: i) goals, ii) shots, iii) penalty goals, iv) penalty shots, v) power play goals, vi) power play shots, vii) possession, viii) power play micro situations (due to player 3 exclusion), and ix) power play. In addition five coefficients (Argudo et al., 2009) were analyzed: i) the coefficient of shot possibility (CSP), ii) the coefficient of shot concretion (CSC), iii) the coefficient of shot definition (CSD), iv) the coefficient of shot definition in a penalty micro situation (CSDP) and v) the coefficient of shot definition in a power play micro situation (CSDPWP).

Results
The Mann-Whitney U test was carried out to establish the differences between winners and losers (p .05). The Mann-Whitney U test showed that winning teams scored more goals ($U = 447.5$; $p < .01$), more penalty goals ($U = 1429.0$; $p = .01$), than losing team. Moreover, winners achieved higher coefficients related to goals (i.e., CSC [$U = 419.5$; $p < .01$], CSD [$U = 373.5$; $p < .01$], CSDP [$U = 1391.5$; $p < .01$] and CSDPWP [$U = 1305.0$; $p < .01$]) than loser teams.

Discussion & Conclusion
The results of the present study are in line with Argudo et al. (2009), who found differences between winning and losing teams with regard to some coefficients (e.g., CSC and CSD). This seems reasonable due to the differences between groups in goals and penalty goals, which might also explain the differences between winners and losers in the CSDP. Finally, while differences appeared in relation to the CSDPWP, no differences were found regarding the performed power play goals and the power play shots. This seems to highlight the major ability of winners to score slightly more than losers despite having slightly fewer opportunities. Coaches should orient their training on ball shooting exercises encouraging players to pass the ball quickly (in order to disorganize defenders) and shooting to score accurately.

References
Argudo, F.M., Ruiz, E., & Alonso, J.I., (2009). 'Were differences in tactical efficacy between the winners and losers teams and the final classification in the 2003 water polo World Championship?', *Journal of Human Sport and Exercise,* 9, pp. 142-153.