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Exploring success of four LIQUI-MOLY Handball Bundesliga teams from 2019 to 2022

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## INTRODUCTION:

Handball is a contact team-sport with the objective to score more goals than the opponent. Knowledge about the match demands and their relation to playing success are crucial to optimizing training procedures. Previous studies show that running related demands do not differ with respect to the match outcome [1], while other studies found differences between winning and losing teams [2]. Thus, the aim of this study was to explore match demands in relation to the team and match outcome in top-level handball players.

## METHODS:

Four handball teams competing over three seasons (2019-2022) in the LIQUI-MOLY Handball-Bundesliga (HBL) were compared and analyzed according the match outcome using a range of common match demand metrics (n = 28) collected by a local positioning system (Kinexon Perform LPS). Match summary statistic files (n = 371, n=228 with ball tracking) were exported using the Kinexon software and merged with the match outcome data. Mean differences were investigated by one-way ANOVAs on trimmed means. Pairwise comparisons were conducted and p-values were adjusted for multiple testing by Bonferroni corrections.

## RESULTS:

The lower ranked teams spent less time at high-speed (-89.9 [-140.0, -48.9]; -132.5 [ 171.5, -93.4]) and high metabolic power (-86.4 [-123.9, -48.9]; -73 [-220.0, -139.4];-179.8 [-220.1, -139.5]), whereas they executed a higher number of jumps (16.7 [9.8, 23.6]; 8.0 [2.0, 13.9]) and passes (168.6 [123.3, 213.9]; 97.2 [47.7, 146.7]; 105.3 [53.4, 157.2]). Winning teams perform slightly less passes (-51.2 [-101.2, -1.14]; -28.4 [-67.6, 10.7]) than drawing teams and show no differences in time at high-speed (29.1 [-25.3, 83.5]; 10.7 [-18.3, 39.8]) and time at high metabolic power (21.0 [-42.3, 84.5]; -24.6 [-55.4, 6.1]) than drawing or losing teams.

## CONCLUSION:

The lower ranked teams spent less time in high-intensity running and perform more passes. In this context, winning teams tend to perform less passes, but do not differ between drawing and losing teams in terms of high-intensity running. These findings provide a new perspective of the influence of match demands on success in top-level handball. It underlines that the players are all “physically well developed” [2] and therefore we hypothesises that technical-tactical actions are more important to win a game at this level. However, more studies that include the technical-tactical context to explain success in top-level handball are needed.

[1] Manchado, C., Pueo, B., Chiroso-Rios, L. J., & Tortosa-Martinez, J. (2021). Time-motion analysis by playing positions of male handball players during the european championship 2020. *Int J Environ Res Public Health*, 18(6).

[2] Venzke, J., Schäfer, R., Niederer, D., Manchado, C., & Platen, P. (2022). Metabolic power and success in men s handball in the european championship. In *ECSS 2022 Book of Abstracts*, Sevilla, Spanien.

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