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Research article

from September
2014**Effect of Court Dimensions on Players'
External and Internal Load during Small-Sided
Handball Games**

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ScholarGoogleMatteo Corvino¹, Antonio Tessitore², Carlo Minganti², Marko Sibila¹, [Author Information](#)[Publish Date](#)[How to Cite](#)[Email link to this article](#)**ABSTRACT**

The aim of this study was to investigate the effect of three different court dimensions on the internal and external load during small-sided handball games. Six male amateur handball players took part in this study and participated in three different 8-min 3vs3 (plus goalkeepers) small-sided handball games (each repeated twice). The three court dimensions were 12×24m, 30×15m and 32×16m. Through Global Positioning System devices (SPI pro elite 15Hz, GPSports) and video analysis, the following parameters were recorded: cyclic and acyclic movements (distance covered and number of technical actions executed), heart rate, and rating of perceived exertion (RPE). Total distance travelled increased with court dimensions (885.2m ± 66.6m in 24×12m; 980.0m ± 73.4m in 30×15m; 1095.0m ± 112.9m in 32×16m, $p < 0.05$). The analysis of distance covered in the four speed zones (0–1.4 m·s⁻¹; 1.4–3.4 m·s⁻¹; 3.4–5.2 m·s⁻¹; >5.2 m·s⁻¹) highlighted substantial differences: playing with the 30×15m court in comparison to the 24×12m, the players covered less distance in the first speed zone ($p = 0.012$; ES = 0.70) and more distance in the second ($p = 0.049$; ES = 0.73) and third ($p = 0.012$; ES = 0.51) speed zones. Statistical differences were also found between the 24×12m and 32×16m courts: the players covered more distance in the second and third speed zones ($p = 0.013$, ES = 0.76; $p = 0.023$ ES = 0.69) with the 32×16m court in comparison to the 24×12m. There was no significant effect of court dimensions on the technical parameters (number of team actions,

passes, piston movements toward goal and defensive activities), the number of specific handball jumps and changes of direction, and the time spent in the different heart rate zones. Considering the average data of all the experimental conditions together (24×12m, 30×15m, 32×16m), a pronounced statistical difference was highlighted between the values in first two HR zones and the last two ($p < 0.05$; large ES). The rating of perceived exertion was significantly higher during the drill with the 32×16m court compared with the 24×12m one ($p < 0.05$; ES = 2.34). Our findings indicate that changing court dimensions during small-sided handball games can be used to manipulate both external and internal loads on the players.

Key words: Handball, sport-specific training, video analysis, Global Positioning System (GPS)

Key Points

- To cover the specific game demands, more specific training methodologies have been developed in many sport games.
- Specific game exercises may provide a useful conditioning stimulus, together with technical and tactical training components.
- Changing court dimensions during small-sided handball games can be used to manipulate both external and internal loads on the players.
- The high ratio of cyclic activity per minute and the high HR values recorded during SSHGs make this type of drills extremely useful for aerobic power training.

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