

Validity and Reliability of the Polar OH1 biceps-band Heart Rate Monitor during Pickleball

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ABSTRACT

Pickleball is making a name for itself as one of the fastest growing sports in the United States. According to the Association of Pickleball Professionals (APP), 14% of Americans 18 years and over (~36.5 million people) played pickleball at least once in 12 months. With almost half of the total players planning to play more often in the upcoming months, pickleball is certain to continue its ascension. It is unclear if paying intensity can be gauged accurately and reliably with heart rate (HR) measurements from biceps-band monitors. **PURPOSE:** This study aimed to determine the validity and reliability of the Polar OH1 heart rate during one, 15-minute round of pickleball. **METHODS:** Participants (2 Female, 8 Male, and 1 identifying as Other) wore two Polar OH1 bands on their left arm, and completed one 15-minute round of pickleball, alternating playing dominant and non-dominant hand every 5-minutes with a 5-minute rest in between. The Polar OH1s collected average and maximum HR, as did the criterion device: Polar H9/H10 chest-strap HR monitor. Validity was measured using mean absolute percent error (MAPE), and Lin's Concordance Correlation Coefficient (CCC). Reliability was measured using the coefficient of variation (CV), and intraclass correlation coefficient (ICC) between the two OH1s. The threshold for validity was $MAPE \leq 10\%$ and $CCC \geq 0.9$. The threshold for reliability was $CV \leq 10\%$ and $ICC \geq 0.7$. **RESULTS:** The Polar OH1 biceps-band HR monitor met the threshold for both validity tests for average and maximum HR (see table). The Polar OH1 met the threshold for validity and reliability for average and maximum HR(see table).. **CONCLUSION:** People who want an accurate and consistent monitoring of their average and maximum HR during pickleball can trust in the feedback from wearing a Polar OH1. Biceps-band technology may be a great option when participating in any racquet-based sports (tennis, pickleball, ping-pong, etc).

	Average			Maximum		
	HR	MAPE	CCC	HR	MAPE	CCC
Validity						
Polar OH1	130.3 ± 18.6	7.14%	0.95	149.6 ± 19.1	7.31%	0.93
Polar H9/H10 (Criterion)	134.5 ± 18.8			154.5 ± 18.8		
Reliability						
Polar OH1	130.3 ± 18.6	4.67%	0.90	149.6 ± 19.1	4.69%	0.87
Device #1	130.3 ± 19.9			149.5 ± 20.4		
Device #2	130.2 ± 18.1			149.7 ± 18.5		