

The biceps-worn Verity provides valid and reliable heart rate measures during variable intensity outdoor activities like trail running

Validity and Reliability of Heart Rate from Biceps-worn Devices During Trail Running

James W. Navalta¹, Dustin W. Davis¹, Elias M. Malek¹, Bryson Carrier¹, Nathaniel G. Bodell², Jacob W. Manning³, Jeffrey Cowley³, Merrill Funk³, Marcus M. Lawrence³, Mark DeBeliso³

INTRO

- 20+ million people participate in trail running
- Biceps worn devices may cause less chafing, but validity and reliability is yet to be determined

RESULTS

- Verity met threshold for both validity tests and both reliability tests for maximum and average HR

- OH1 met threshold for validity for maximum HR but not average HR or reliability measures

DISCUSSION

- It is important to conduct both validity and reliability testing when making decisions on wearable technology and appropriate use cases, particularly in outdoor environments

Validity	Maximum			Average		
	HR	MAPE (%)	CCC	HR	MAPE (%)	CCC
H10	185 (12)			163 (13)		
Verity	185 (12)	0.63	0.977	160 (15)	1.60	0.930
OH1	185 (12)	1.62	0.762	157 (13)	3.29	0.597
Reliability	HR	CV (%)	ICC	HR	CV (%)	ICC
Verity 1	185 (12)	0.33	0.982	160 (11)	0.50	0.988
Verity 2	185 (12)			161 (11)		
OH1 1	183 (11)	1.51	0.635	158 (12)	2.49	0.569
OH1 2	180 (12)			158 (13)		

¹University of Nevada, Las Vegas
²CSU, San Bernardino
³Southern Utah University

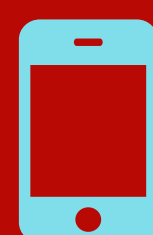


METHODS

- N = 17 participants (F = 7)
- 10-min run out, then return to trailhead
- Validity: Mean Absolute Percent Error (MAPE), Lin's Concordance Correlation (CCC)
- Reliability: Coefficient of Variation (CV), Intraclass Correlation Coefficient (ICC)
- Polar Verity and OH1
- Thresholds: MAPE<10%, CCC>0.90, CV<10%, ICC>0.70



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