

15. SWACSM Abstract

Validity of Average Heart Rate and Energy Expenditure in Polar OH1 and Verity Sense While Self-Paced Running

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ABSTRACT

Running is one of the most common forms of exercise in the world today. Technological advancements have contributed to the rise in the usage of wearable technology. Polar is a household name leading this amelioration of wearable technology. The Polar OH1 and Verity Sense are two of the typical models used to measure heart rate and energy expenditure, however, the validity of these devices have yet to be investigated. **PURPOSE:** The purpose of this study was to determine the validity of the Polar OH1 and the Verity Sense during self-paced running. **METHODS:** Twenty participants (n=10 female, n=10 male; 23.5±6.48 years) participated in the study. The Polar OH1 and the Polar Verity Sense were affixed to alternate biceps. The Polar H10 heart rate strap, in conjunction with the COSMED K5 portable metabolic cart, was used as the criterion reference. Participants proceeded to run at a self-paced rate for approximately 10-15 minutes. Data collection commenced upon reaching 70% of their estimated max heart rate and was observed for a period of 5 minutes. Mean absolute percent error (MAPE, ≤10%) and Lin's Concordance ($\rho \geq 0.7$) were used to validate the device's average HR (in bpm) and estimated EE (in kcals) compared to criterion reference. Dependent T-tests were run to determine any possible differences ($p \leq 0.05$). **RESULTS:** The Polar Verity Sense is a valid measure of HR (MAPE 6.83%, Lin's=0.68) when measured against the Polar H10 criterion. The Polar OH1 nears validity (MAPE= 6.01%, Lin's=**0.72**). The Polar Verity Sense and OH1 were not valid measures for estimated energy expenditure (see table 1). **CONCLUSION:** The Polar Verity Sense is a valid measure of HR for self-paced running. Both the Polar Verity Sense and OH1 are not valid for the estimation of EE.

Table 1

	Polar H10	Verity Sense	Polar OH1
Mean HR (bpm)	162±23.49	166.37±19.75	167±22.49
MAPE		6.83%	6.01%
Lin's Concordance		0.68	0.72
t-test		0.28	0.21
Estimated EE (Kcal)	173.05±53.06	194.84±67.69	190.47±66.57
MAPE		22.88%	22.77%
Lin's Concordance		0.67	0.72
t-test		0.05	0.09