



2-2019

The Accuracy of Blood Pressure Measurement by a Smartwatch and a Portable Health Device

Vignesh Murali

Thomas Jefferson University, vignesh.murali@jefferson.edu

Noud van Helmond

Thomas Jefferson University, noud.van.helmond@jefferson.edu

Cecilia G. Freeman

Thomas Jefferson University, cecilia.freeman@jefferson.edu

Christina Hahnen

Thomas Jefferson University, christina.hahnen@jefferson.edu

Nilanjan Haldar

*Thomas Jefferson University, nilanjan.haldar@jefferson.edu**See next page for additional authors*

[Let us know how access to this document benefits you](#)

Follow this and additional works at: https://jdc.jefferson.edu/si_ctr_2021_phase1 Part of the [Anesthesiology Commons](#)

Recommended Citation

Murali, Vignesh; van Helmond, Noud; Freeman, Cecilia G.; Hahnen, Christina; Haldar, Nilanjan; Hamati, Jacquelyn N.; Bard, Dylan M.; Merli, Geno J.; and Joseph, Jeffrey I., "The Accuracy of Blood Pressure Measurement by a Smartwatch and a Portable Health Device" (2019). SKMC JeffMD Scholarly Inquiry, Phase 1, Project 1.

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Phase 1 by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.

Authors

Vignesh Murali, Noud van Helmond, Cecilia G. Freeman, Christina Hahnen, Nilanjan Haldar, Jacquelyn N. Hamati, Dylan M. Bard, Geno J. Merli, and Jeffrey I. Joseph

Vignesh Murali
SKMC Class of 2021
SI CTR Abstract
12/14/18

The Accuracy of Blood Pressure Measurement by a Smartwatch and a Portable Health Device

Vignesh Murali, Noud van Helmond, Cecilia G. Freeman, Christina Hahnen, Nilanjan Haldar, Jacquelyn N. Hamati, Dylan M. Bard, Geno J. Merli, Jeffrey I. Joseph

Introduction: Hypertension is a leading cause of mortality. Proper blood pressure (BP) control can be achieved by lifestyle modification, pharmacotherapy, and frequent measurements. With the growing popularity of cuffless blood pressure monitors, it is important to independently validate their accuracy.

Objective: We evaluated two cuffless blood pressure monitors, The Everlast TR10 fitness watch and the BodiMetrics Performance Monitor, for their accuracy and precision in BP measurements.

Methods: Using a protocol derived from the ANSI/AAMI/ISO 2013 standard for evaluating automated sphygmomanometers, we measured the blood pressures of 85 patients recruited from the Thomas Jefferson University Hospital Preadmission Testing Center with two experimental devices and a validated automated sphygmomanometer cuff. We compared the mean absolute differences in measurements between the investigational and reference devices. Comparisons were analyzed with Spearman correlation and T-test, $p < 0.05$.

Results: The BodiMetrics Performance Monitor SBP measurements correlated well with the reference SBP measurements ($\rho = 0.88$, $P < 0.01$), whereas the Everlast TR10 fitness watch did not (SBP: $\rho = -0.19$, $P < 0.01$; DBP: $\rho = -0.01$, $P < 0.01$). The BodiMetrics performance monitor reported a hypertensive BP (≥ 140 mm Hg) for 80% of the hypertensive reference SBP

measurements, whereas the Everlast watch measured no hypertensive BP values for any of the hypertensive reference SBP or DBP measurements.

Discussion: The Everlast fitness watch and BodiMetrics Performance Monitor are not accurate enough to use for blood pressure monitoring. Use of these devices will likely result in misclassifying patients with hypertension as normotensive, which is a public health concern.