

Accuracy of Automated Blood Pressure Monitors

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ABSTRACT

The purpose of this study was to examine the accuracy of two automated blood pressure (BP) monitors (Omron Model #BP791IT, brachial and Life Source Model #UB-521, wrist; BR and WR respectively). This study was approved by the TAMU-SA IRB and 41 subjects (Age=26.8±7.3 yrs, Ht=167.9±3.3 cm, Wt=88.0±44.6 kg, BMI=28.2±6.4) reported to the lab after fasting for at least four hours and sat quietly for five minutes, after which blood pressure was measured using a mercury gauge (CRIT) by the investigator, then BR followed by WR. A repeated measures ANOVA test was used to explore for differences in mean arterial pressure (MAP) among the three readings. Two groups were formed by placing those above the CRIT systolic mean (126 mmHg) to represent a lower BP group (115.4±6.2 mmHg) and a higher BP group (137.3±8.33 mmHg), after which a 2 (group) X 3 (method of reading) factorial ANOVA was conducted to explore for differences between groups. Alpha was set at ≤.05 for all tests. The repeated measures ANOVA indicated the BR (100.5±13.5 mmHg) and WR (101.7±13.7 mmHg) MAP were significantly greater than CRIT (95.5±10.6 mmHg), P<.05. The factorial ANOVA indicated no significant interaction among group and method of reading (P>.05), however, the main effect of method indicated significant differences between both instruments and CRIT in systolic readings (P<.05), and a significant difference in diastolic readings between CRIT and WR only, P<.05 (Table 1).

Table 1. Seated Blood Pressure Readings among Manual (CRIT) and Automated (Brachial and Wrist) Methods

	Total (N=41)	Lower Group (n=21)	Higher Group (n=20)
Systolic (mmHg)			
CRIT	126.1±12.2	115.4±6.2	137.3±8.3
BR	135.9±19.0	122.6±12.3*	149.2±14.8*
WR	131.1±18.7	120.2±11.2*	144.5±17.3*
Diastolic (mmHg)			
CRIT	80.2±10.4	74.6±6.8	86.1±10.3
BR	82.8±12.1	75.8±6.4	89.9±12.5
WR	86.9±12.5	78.3±6.4**	97.6±9.5**

*Significantly different from Systolic CRIT, **Significantly different from Diastolic CRIT

Although the readings between groups were not significantly different, differences between CRIT and BR (11.9 mmHg) and WR (7.2 mmHg) in the Higher Group tended to be greater than differences in the Lower Group (BR=7.2 mmHg and WR=4.8 mmHg). Although consumers, doctors, and other professionals may rely heavily on the use of automated blood pressure monitors for getting a quick blood pressure reading, the results may not be as accurate as they should be. These implications could be more severe for those with higher BP's, especially when using BR.